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AIR CONDITIONING AND REFRIGERATION News

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Inside Dope

By George F. Taubeneck

Another 'Now It Can Be Told'
Answer to the Suicide Bomber
Larsen, Blood, and Reindel
How It Works
What They Ran Up Against
Behind Locked Doors
Code of Ethics of the Toledo Appliance Dealers

Another 'Now It Can Be Told'

Now that the industry is virtually at a standstill because the so-called "working man" isn't working, "Inside Dope" is turning temporarily to other fields of inquiry. (We all need to do something to get our minds off our troubles!)

Last week we began talking about radar and electronics. It had been intended to continue that discussion this week. But in the meantime something else has come up—another "now it can be told."

This one involves Norge's contribution to the war effort—a super-hush-hush automatic *blind-firing* gun director for the Navy.

We got a peak at this gadget last Thursday at a luncheon here in Detroit. And the Navy says that it's O.K. now to tell the story.

Answer to the Suicide Bomber

In removing the blanket of secrecy which has covered this project since its inception more than two years ago, the Navy gives full credit to engineers and craftsmen of the Norge division of Borg-Warner Corp. for their part in perfecting the electrically controlled director which causes a gun to search out and follow a target in daylight or darkness, regardless of weather.

Pointing out that the Navy viewed this project "as one of the most important fire-control developments of the war," Vice Admiral George F. Hussey, Jr., Chief of the Bureau of Ordnance, last spring called upon Norge to continue their endeavors, stating that this company was being depended upon to perfect the mechanical design of the director.

This director, he declared confidentially, appeared to the Navy as the answer to the Japanese "Kamikaze" suicide bomber.

After V-J Day, Admiral Hussey again requested Norge to continue with the manufacture of these gun directors because they were needed in the nation's postwar fleet.

Of three firms who were originally requested to work on the design, Norge alone produced a satisfactory model which met the Navy's requirements.

Larsen, Blood, and Reindel

The story of the development is a story of a long uphill battle against such factors as weight, size, friction, inertia, shocks, gun blasts, and vibration. Much of the credit for winning this battle is given by the Navy to its own Bureau of Ordnance representative, Paul J. Larsen, and to Howard E. Blood, Norge president, and Ira H. Reindel, Norge director of engineering, who worked together as a directing team.

Norge engineers were handed a wooden scale-model of a gun director in December, 1943. This scale model was built by scientists of Johns Hopkins University. The basic developments stem from the work of Dr. C. S. Draper of the Confidential Instruments Laboratory at the Massachusetts Institute of Technology.

(Concluded on Page 17, Column 1)

Case Dealers To Better Relations In Local Assns.

CHICAGO — With the announcement of the formation of The Commercial Refrigerator Distributing Association of New York (see follow story at end of this story), local commercial refrigerator dealer organizations have been formed in most of the major cities in the United States.

The Commercial Refrigerator Manufacturers Association, which has helped to sponsor the formation of these local groups, is planning to encourage the formation of similar organizations in any locality where sufficient interest is demonstrated.

To the present time, it has been common practice to accept only commercial refrigerator dealers or distributors (those handling primarily display cases, reach-in and walk-in coolers, etc.) into these local groups. It is considered probable that a national organization will be formed when a sufficient number of local organizations or chapters have been functioning long enough to justify a welding together of the small groups.

The usual approach for the formation of a local commercial refrigerator dealer organization has been for one member of the industry in a given area to invite two or three other distributors to a luncheon for

(Concluded on Page 4, Column 4)

OPA to Study Boost For Condensing Units

CHICAGO—The OPA Compressor and Condensing Unit Industry Advisory Committee is scheduled to meet here Jan. 25, to consider the results of a cost-and-profits survey of selected manufacturers, with a view to determining if an overall price increase should be granted to the industry.

Some individual price adjustments have been made for a few manufacturers of condensing units under MPR 591, but other producers having either failed to apply or having submitted unqualified applications, the pricing situation has been confused and inequitable. OPA thus called

(Concluded on Back Page, Column 2)

St. Paul Chosen for ASRE Spring Meeting

DETROIT—Spring meeting of the American Society of Refrigerating Engineers will be held in St. Paul, Minn., next June, it was announced by Charles S. Leopold, national A.S.R.E. president, at the January meeting of the Detroit section.

This spring meeting will be the first one held since the meeting in June of 1944, held in Pittsburgh.

Bishop Co. Consolidates 2 Home Freezer Firms

CHAMPAIGN, Ill. — The R. H. Bishop Co. has been incorporated here to consolidate three companies formerly operated as Mid-States Engineering Co., Gemco Hanger Mfg. Co., and R. H. Bishop Co., announces R. H. Bishop, president.

Both the Mid-States and Bishop companies manufactured home freezers in addition to other types of refrigeration, air conditioning, and ventilation equipment.

The new corporation took over all assets of the three firms, and assumed all existing liabilities and commitments as of Jan. 1.

Marts' Appliances Surprise Buyers

CHICAGO—Roundup from the winter furniture and home furnishings market at the Merchandise Mart and the American Furniture Mart:

Registered attendance of more than 20,000, and total attendance of all interested parties of over 30,000, sets new records.

Buyers surprised by completeness of appliance displays, indicating reconversion completed by most major producers.

However, shipments of appliances in any quantities, buyers found, will depend on the materials and labor supply. "Anything with a motor in it" may be on the scarce list for some time.

Dates were approved for the semi-annual markets for the next two years, as follows:

1946 summer market....July 8-20
1947 winter market.....Jan. 6-18
1947 summer market....July 7-19
1948 winter market.....Jan. 5-17

(A complete resume of the appliance product news at the midwinter markets will be published in the next issue.)

Aviation Corp. In Frozen Food Group

SYRACUSE, N. Y.—Newest member of the Frozen Food Foundation is the Aviation Corp. R. C. Cosgrove, vice president in charge of sales for Avco, has been elected a trustee.

Most of the membership of the Frozen Foods Foundation is comprised of individual department stores and retail store groups. Purpose of the Foundation is to study the possibilities of marketing frozen foods and home freezers through such stores. The only other manufacturer member thus far is Carrier.

The move by Avco has aroused some speculation that the Crosley Corp., an Avco subsidiary, might be contemplating large-scale production of a home freezer.

Bensen Will Manage McQuay Refrigeration

MINNEAPOLIS—C. L. Bensen has been appointed manager of the refrigeration division of McQuay, Inc., R. C. Colman, vice president and general sales manager, has announced.

For the past three years Mr. Bensen has been in charge of the aircraft division of McQuay, Inc., and prior to that time was chief engineer for 10 years. He has been with the McQuay organization since 1928.

Mr. Benson's new duties will be directed towards the establishment of the new jobber policy on refrigeration products, it was said.

Outcome of Steel Dispute May Hold Key to Electrical Strike

* * *

Long Steel Strike Could Shut Off Production

DETROIT — "The home appliance output picture is better than it appears, and a turn for the better in the labor situation could make for heavy production in the next 60 days."

So declared a commentary in the Business Section of a recent issue of the *New York Times.*

However, the "labor situation" right now is definitely clouding the picture. As noted elsewhere on this page, the electrical workers strike not only directly affects General Electric, Frigidaire, and Westinghouse appliance production, but because all three represent large productive capacity in electric motors, one of the shortest of the "short" parts, the strike will affect other producers.

If the steel strike is not averted, appliance production will definitely be affected, and a protracted steel strike might cause complete shutdowns. It is not felt that the contemplated price rise of $4 per ton on steel, which might be part of a strike settlement, would affect prices of major appliances.

Unofficial figures on refrigerator sales by manufacturers for the past three months show a definite increase in refrigerator production. These figures show that 150,000 refrigerators were shipped in December, as compared with 115,000 in November, and 84,000 in October.

* * *

Motor Stoppage Hits Refrigeration Industry

NEW YORK CITY—With 200,000 workers on strike in 80 plants of General Electric Co., Westinghouse Electric Corp., and electrical divisions of General Motors Corp., the nation's lagging output of electric refrigerators and other appliances has been further curtailed.

Little effort is being made by the government to effect a truce between the companies and the CIO union which called the strike—the United Electrical Radio & Machine Workers of America.

A single Federal conciliator has been assigned to the case, but the government, the union, and the companies are apparently awaiting the outcome of the present negotiations over wage demands in the steel industry.

Although plants of the three companies are the only ones directly involved in the strike, other major producers of household and commercial refrigerators will be affected. G-E, Westinghouse, and Delco Products division of GM (which produces electric motors for Frigidaire), also supply motors to other big manufacturers of refrigerators, so the latter firms may have to limit their production.

In this connection, one motor manufacturer revealed that the present backlog of motor orders is so bad that plants are not only failing to catch up but are falling even farther behind.

The Civilian Production Administration has asked for voluntary rationing of electrical supplies during the strike, and has promised that it would try to help hospitals, transportation lines, public utilities, food processors, and police and fire authorities if local emergencies develop due to lack of electrical equipment.

A new development in the controversy last week was the cancellation by Westinghouse of its contract with the union, termination to take effect on March 31, its expiration date, according to an announcement by W. G. Marshall, Westinghouse vice president.

Contracts with the CIO union have been "like a one-way street, with all the benefits going one way—to the union," charged Mr. Marshall.

"Unrealistic union benefits and unrealistic union advantages have been forced into labor-management agreements generally under the pressure of the war emergency, when the paramount need of the country was for increased production regardless of concessions to union representa-

(Concluded on Page 25, Column 1)

Excise Tax Doesn't Apply To Freezers

WASHINGTON, D. C.—Most home freezers are not subject to the tax imposed on manufacturers' sales of mechanical household type refrigerators under section 3405 (a) of the Internal Revenue Code, according to an interpretation made by D. S. Bliss, deputy commissioner of Internal Revenue.

"Under the present rulings of this bureau it is held that machines whose only functions are to quick-freeze foods and to hold foods in frozen storage are not taxable under section 3405(a) of the code," said Mr. Bliss.

"On the other hand, home freezers, which, in addition to performing the above functions, have a food storage space in which the temperature is maintained slightly above freezing are taxable as household type refrigerators, provided the net storage capacity of the above-freezing refrigerated space does not exceed 20 cu. ft.," he explained.

Now, If They'll Just Install Some Sirens On Refrigeration Repairmen's Trucks . .

NEW YORK CITY—Refrigeration repairmen answering emergency service calls are permitted to park in restricted areas here, according to official orders issued to the New York police department and recently supported by a traffic court judge in a case defended by counsel for the Refrigeration & Air Conditioning Guild, Inc.

Before the war, police had permitted service men on emergency calls to ignore some of the city's stringent rules on parking. In wartime these restrictions were eased somewhat, but soon after the war ended, the strict parking rules were reinstated.

At this time the Refrigeration Guild convinced police officials that emergency service calls were just as important now as previously, so a new teletype concerning parking for these repairmen was issued to members of the police department early in November.

Despite this order two employes of the Manhattan Refrigeration Service Co. were ticketed for a parking violation, fines for which have been raised to $15 for the first offense.

Appearing in traffic court, the mechanics were represented by Schneider & Edelstein, counsel for the guild. The judge agreed that refrigeration mechanics should not be forced to pay a fine for parking violations while on emergency service calls.

Army & Navy Stores Must Employ OPA's Appliance Prices

WASHINGTON, D. C. — Although stores operated by the Army and Navy have been granted some exceptions to OPA pricing regulations in close-out sales, these exceptions do not apply to 13 items, including used household mechanical refrigerators, which will continue to be governed by existing price regulations, OPA has ruled in Amendment 2 to SO 27, effective Jan. 29.

Among the items listed, and the price regulations which will continue to apply to them, are: new household vacuum cleaners (111), used mechanical household refrigerators (139), used household vacuum cleaners (294), used domestic washing machines (372), new ice boxes (399), and used domestic gas cooking ranges (527).

Kansas City Hardware Firm Will Employ Outside Salesmen, New Credit Plan In Appliance Drive

KANSAS CITY, Kan.—One of the fastest-growing hardware firms in the middle west, Drew's, has a modernistically designed appliance department in it's new, capacious, store on Central Ave. here.

Refrigerators, air conditioning units, home freeze lockers, and a complete line of appliances, are on the agenda at the new store, which has a 75 ft. frontage, and a depth of 117 ft.

Walter Drew, and his brother, Frank, have a full-fledged promotional program designed to promote fast sales of all appliances as soon as these items can be stocked in quantity.

A credit plan, much like that used in large department stores, is being put into operation, with a specially trained credit staff to take care of the time-payment clientele.

A full-fledged credit department is something new in hardware merchandising in this section of the country, but Walter Drew, who has been in the main responsible for the firm's wartime growth, considers it the only way in which a hardware firm can compete for refrigeration and other appliance sales.

Outside salesmen will be employed, and a speedy delivery service for major appliances will be part of the scheme of things. One of Walter Drew's major postwar goals is to make his store a one-stop proposition for shoppers, and he is rapidly approaching this goal by the completely stocked departments in his new building.

National brand merchandise will be carried, and Walter and Frank Drew have signed franchises with such well-known companies as Norge, Kelvinator, and Hotpoint.

One spacious sales room will be devoted to refrigerators and other appliances. The building which the firm recently vacated is situated just around the corner from the new store building, and it is Walter Drew's intention to use the old quarters for showing off used, trade-in appliances taken in on the new appliances the company intends to handle.

This used appliance division will be operated as a separate unit with a separate advertising program, window displays, and management.

The store is located on a transfer point, 20 minutes from downtown Kansas City, Mo., which makes it possible to develop a clientele from both the Kansas Cities. A service department has been set up in the basement of the big store.

Rules Set For Utilizing Wage Boosts as Basis For Price Increases

WASHINGTON, D. C. — If wage increases are to be used as a basis for obtaining higher ceiling prices, rents, or costs of goods furnished to the government, approval for these wage increases must be obtained from the Wage Stabilization Division of the War Labor Board, according to an official interpretation of recent government rulings.

General restrictions on most wage increases have been dropped, with the exception of the building and construction industry and the basic steel industry, it was pointed out.

If an employer's application for a wage increase is denied, he may still grant the wage increase without facing any government penalty—but, this increase will not be considered in any determination of ceiling prices, explain WLB officials.

Present regulations, however, prohibit applications of wage increases which are conditional upon obtaining higher ceiling prices, although it is permissible to submit applications to WLB for wage increases which will not be effective until approved by the government or until OPA has ruled on a requested increase in ceilings.

(The latter ruling apparently allows the employer to delay granting a proposed raise in wages until OPA has decided on his application for higher prices, but he must grant the wage increase after OPA has announced its ruling, whether it is favorable to the employer or not.)

"Cost-of-living" wage increases for groups of employes whose average straight time hourly earnings have not risen 33% above the level of January, 1941, can be approved, the WLB also stated. This factor is not to be computed on the basis of the earnings of an individual employe, but is to be based on the average earnings of a group, such as the collective bargaining group of the employes in question, it was explained.

Gopel Sales Chief For Wesco In Newark

NEWARK, N. J.—Robert A. Gopel, of this city, now on terminal leave from the Army, has been appointed appliance sales manager by the Westinghouse Electric Supply Co. of Newark and Trenton.

Lt. Col. Gopel wears four battle stars for combat in Italy and France, and holds the Bronze Star with Oak Leaf Cluster, the Presidential Unit Citation Ribbon, as well as the Combat Infantry Badge. He entered service in August, 1941, as a first lieutenant.

Ceiling Price Established For Norge Gas Range

DETROIT — Approval of ceiling prices to consumers and dealers for a gas range, Model N-401, manufactured by Norge Division of Borg-Warner Corp. is contained in Order 220, MPR 64, recently issued by OPA.

Retail prices, including the Federal excise tax but not state or local taxes, are: $126.50 in Zone 1, $130.95 in Zone 2, $132.95 in Zone 3, $134.25 in Zone 4, and $135.95 in Zone 5. These prices also include delivery and installation, according to the order, which directs the retail dealer to subtract $6 from the foregoing prices if he does not provide installation.

The order established the following prices, including the Federal excise tax, for sales by wholesale distributors to retail dealers: Zone 1, $77.43; Zone 2, $80.21; Zone 3, $81.46; Zone 4, $82.27; and Zone 5, $83.33. These prices are f.o.b. the wholesale distributor's city.

Kay Returns To Post With Frigidaire

DAYTON, Ohio—J. K. Kay, former member of Frigidaire's advertising and sales planning department, has returned in the capacity of manager of organization promotions after three years in the Armed Forces.

Joining Frigidaire in 1937 as head of public utility promotions, Mr. Kay was associated with the advertising and sales planning department until his entrance into the Army in 1942. Entering the Army as a Captain, he had attained the rank of Lieutenant Colonel at the time of his discharge.

Denison New Bendix Purchasing Agent

SOUTH BEND, Ind.—M. R. Denison has joined Bendix Home Appliances, Inc., here, as purchasing agent, it is announced by H. L. Spencer, vice president in charge of manufacturing.

With 32 years' experience in production and purchasing for automotive manufacturers, Mr. Denison came to Bendix from the White Motor Co., Cleveland. He previously was employed in executive positions for 24 years by Studebaker in Detroit and South Bend.

In the Cleveland position he had charge of purchases in the unit division and during the war years he directed the purchase of all castings for the White company.

Prices, Discounts Set For Toaster Model

NEW BRITAIN, Conn.—Maximum retail price of an automatic toaster, Model EA 2601, manufactured by Landers, Frary & Clark, has been established at $16.80 by OPA Order 4786, MPR 188.

On sales to distributors (wholesalers and jobbers), a ceiling of $8.80 was fixed, with sales to dealers limited to $10.40 for six or more units and to $11.20 for less than six. The Federal excise tax is included in these prices.

For sales by the manufacturer, the maximum prices apply to all sales and deliveries since MPR 188 became applicable, and for sales by any others, the ceilings apply after the effective date of the order.

Bergenthal Retires From Wagner Electric

ST. LOUIS—Wagner Electric Corp. announced the retirement of V. W. Bergenthal as an executive officer of the company. Mr. Bergenthal, who will continue to serve as a director, has been with Wagner for 41 years—since Nov. 1, 1904, when he took his first position with the company as assistant sales manager.

In 1913 he was appointed purchasing agent and served in that capacity until 1922. In 1922 Mr. Bergenthal was elected a director, and later that year he was elected treasurer.

Mr. Bergenthal is succeeded as treasurer by J. D. Eby who has been elected secretary-treasurer of Wagner Electric Corp. Mr. Eby already held the position of secretary.

DUAL-TEMP...

TRADE MARK REGISTERED

BY... Admiral

Here's what the home-maker wants in her new ELECTRIC REFRIGERATOR according to a recent survey made by the editors of a leading women's magazine!

Gives them what they want!

WOMEN WANT... More storage space for frozen foods *plus* a roomy quick-freeze compartment.

DUAL-TEMP'S GOT IT!... A built-in Freezing Locker that stores 80 lbs.... nearly 2 bushels ... of frozen food. *Really* quick freezes meats, fruits, vegetables at 5° below zero. Hundreds of ice cubes quickly available.

WOMEN WANT... More space for food ... greater ease and convenience in handling food.

DUAL-TEMP'S GOT IT!... A spacious food compartment with *extra* room for large size objects. Space-stealing coils are gone! More shelf area for easier food handling. Every item readily accessible.

WOMEN WANT... Less "waste" of food due to food drying out while stored away in the refrigerator.

DUAL-TEMP'S GOT IT!... Foods stay moist and fresh in *uncovered* dishes! No moisture-stealing coils! 85% humidity maintained throughout food storage compartment. Sterilamp controls odors, retards mold.

WOMEN WANT... Better methods of defrosting ... less fuss and bother with water-filled evaporator trays.

DUAL-TEMP'S GOT IT!... No more defrosting! Dual-Temp *has no coils to defrost* ... no evaporator tray filled to overflowing! Ends the nuisance of spilled water ... in the refrigerator or on the floor!

Admiral Corporation

Chicago 47, Illinois

RADIOS ... DUAL-TEMP REFRIGERATORS ... HOME FREEZERS ... ELECTRIC RANGES

ONLY ADMIRAL CAN BUILD A DUAL-TEMP!

OPA Sets Discounts On C. V. Hill Line

TRENTON, N. J.—Discounts to be used by C. V. Hill & Co., Inc., here in determining ceiling prices for sales of its refrigeration products to various classes of the trade are included in a recent OPA ruling.

Order 40, under Supplementary Order 119, directs that maximum prices of the products described in the company's price and data catalog No. 66 will be the list prices effective June 1, 1941, subject to the following discounts:

	Per Cent
On sales to self-financing jobbers or distributors, and chain stores with 100 or more outlets	45
On sales to "Hill-financed" jobbers or distributors, and chain stores with less than 100 outlets	40
On sales to dealers	30
On sales to consumers	None

Ceiling prices of the company's non-refrigerated fixtures and Utility Fifty also are to be computed using June 1, 1941, prices as a basis, subject to these discounts:

	Per Cent
On sales to self-financing jobbers or distributors, and chain stores with 100 or more outlets	30
On sales to "Hill-financed" jobbers or distributors, and chain stores with less than 100 outlets	25
On sales to dealers	20
On sales to consumers	None

OPA ruled that, except for manufacturers who purchase Hill products for use in the production of other refrigeration items, maximum prices for sales by any reseller will be "his current maximum price to each class of purchaser plus the actual dollars-and-cents increase in present cost resulting from the increase granted the manufacturer. . . ."

Directors, Officers Reelected by York

YORK, Pa.—At the annual meeting here Jan. 8 of stockholders of York Corp., Carl W. Fenninger, Walter Geist, and John S. McMartin were reelected as directors for a three-year term.

Other directors now serving terms of office are: Josiah W. Gitt, Philip W. Glatfelter, Elmer A. Kleinschmidt, Stewart E. Lauer, George S. Munson, William S. Shipley, and Llewellyn Williams.

The directors met immediately following the stockholders meeting and reelected the following officers: Mr. Shipley, chairman of the board; Mr. Lauer, president; Mr. Kleinschmidt, executive vice president; Mr. Williams, vice president; John R. Hertzler, vice president; John F. Lebor, secretary and treasurer; Donald M. Magor, controller; and Joseph F. Witman and Charles J. Malone, assistant secretaries.

Mote Baird Enters Parts Business In Florida

GREENSBORO, Ala. — Mote W. Baird, for 25 years associated with Frigidaire and Kelvinator, recently entered the refrigeration parts, supplies, and equipment business in Florida. For the past 13 years he had been with Kelvinator in the commercial and parts and supplies fields.

Sudekum Heads Chicago's Commercial Distributors

CHICAGO — At their monthly luncheon meeting at the LaSalle hotel, members of the Commercial Refrigeration Distributors Association of Chicago elected the following officers to serve during the current year:

President—W. H. Sudekum, Hussmann Refrigeration, Inc.; Vice President—Perry E. Joy, Super-Cold Midwest Co.; Secretary—Irving Shell, Lee-Shell Co.; and Treasurer—E. J. Matot, D. A. Matot Co. These men, with Fred Avery of Universal Store Fixture Equipment, will constitute the organization's Executive Committee.

The meeting was featured by a talk on commercial refrigerator developments in Great Britain by F. H. Meyers, Director of Automatic Refrigeration Co., London, who is on a buying trip to this country.

10 District Sales Managers Appointed As G-E Reorganizes Conditioning Dept.

BLOOMFIELD, N. J.—Ten district managers have been named to head the sales organizations of the General Electric Co.'s air conditioning department throughout the country, the new appointments marking the inception of a revised organization of the department's field staff, reports J. P. McIlhenny, sales manager.

The general Electric Co. has divided the country into 10 districts, each district having a manager to head the sales activities.

The new district managers are:

R. S. Thurston with headquarters in Boston, New England district; L. T. Brockbank with headquarters in New York, New York district; C. S. Morash with headquarters in Philadelphia, Atlantic district; G. B. Hightower with headquarters in Atlanta, southeastern district; J. F. Murphy with headquarters in Cleveland, east central district; J. F. Carland with headquarters in Chicago, north central district; J. P. Turner with headquarters in Kansas City, central district; V. L. Strange with headquarters in Dallas, southwestern district; E. H. Howes, with headquarters in San Francisco, pacific district; W. H. Stover with headquarters in Portland, northwestern district.

San Francisco Contractors Elect Turner President

SAN FRANCISCO — Officers and new headquarters for 1946 have been annonuced for San Francisco's Refrigeration Contractors Association of Northern California by Z. E. Jones, secretary-manager.

A. K. Turner, of Oakland, last year's vice president, is the association's new president. Lee Shirar, of San Francisco, is vice president. Ed Tanner of San Francisco, is treasurer; and Al Robinson, of Oakland, is recording secretary.

The board of directors includes these gentlemen and J. B. Chapman, C. H. Merrill, E. L. Sattler, and J. A. Scatena.

The association's new headquarters will be at 83 McAllister St.

Postwar 'Dream Home' Features Conditioning

LOS ANGELES—One of the chief features of the "Postwar House" being erected at the corner of Wilshire and Highland Blvds. here is a complete year-around packaged air conditioning system.

Built by the research division of Fritz B. Burns Housing Projects, the house will contain new materials, ideas, and designs which had been waiting the war's end for introduction.

The house, say the sponsors, "will have all the charm that we all expect of tomorrow's home."

Air conditioning will be supplied by Chrysler Airtemp packaged units —a forced warm-air unit and a packaged air conditioner.

FOR *Lasting* PROTECTION USE THESE HENRY STRAINERS

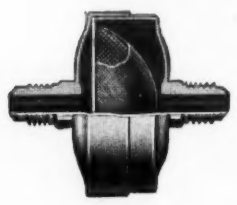
The protection these Henry Strainers provide for suction and discharge lines is complete, positive and long lasting. Screens are so securely held in place that by-passing is impossible. Foreign particles in a system are permanently trapped before they can impair efficient operation or cause damage to control equipment or internal compressor parts. And Henry screen areas are so generous in size, and free areas consequently so extensive, that there is no appreciable pressure drop even after long periods of service.

Maximum protection against leakage is inherent in the design and construction of Henry Strainers. The brass shells on Types 890, 891 and 892, for example, are drawn in a die, with a soldered cap only on the inlet end. The Type 866 Angle Strainer has a patented, distortion-proof flange which not only prevents leakage, but permits cleaning the screen without removing the strainer from the line. Fittings and connections are all silver soldered, and possess more than sufficient strength to withstand all installation strains. Use these Henry Strainers on all your jobs, to give your customers efficient, low cost protection and to assure satisfaction with your work.

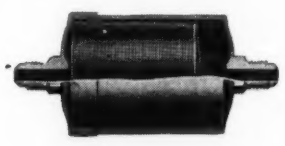
ASK YOUR JOBBER . . . HE ALSO RECOMMENDS HENRY STRAINERS

HENRY VALVE CO. TRADE MARK

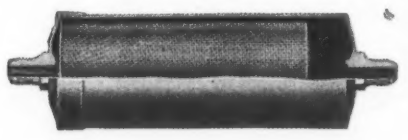
HENRY Soldered Shell Strainers



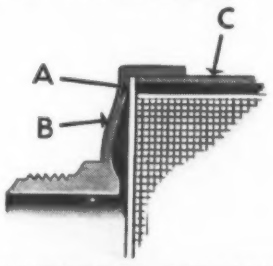
TYPE 890 . . . Has 4 sq. in. screen area, 120 mesh brass screen with No. 10 brass screen reinforcement. 2" O.D. ¼", ⅜" and ½" flare connections.



TYPE 891 . . . Screen area, 11.5 sq. in. Welded seam 100 mesh monel screen. Also 50 mesh screen for suction line service. ¼", ⅜" and ½" flare connections.



TYPE 892 . . . Has 26 sq. in. screen area. Choice of 100 mesh or 50 mesh monel screen. ¼", ⅜", ½" and ⅝" flare connections.

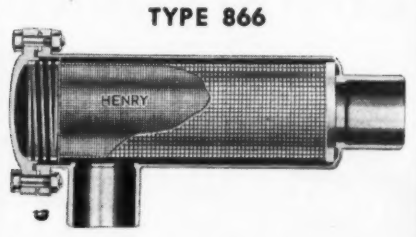


ANCHORED SCREENS PREVENT BY-PASSING

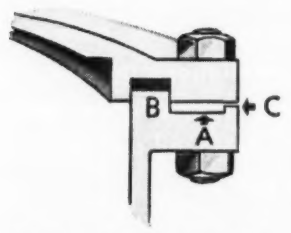
In this cross sectional detail of the inlet end of a Henry Soldered Shell Strainer, note how the screen collar (A) is anchored between the end cap (B) and the shell (C).

Angle Strainer with Solder Connections

TYPE 866



The strainer screen can be removed for cleaning and reinserted without taking strainer from the line. Will not trap oil. 100 mesh welded monel screen. Available sizes: ⅜" to 2⅝" O.D.S. inclusive and with screen areas ranging from 23 to 85 sq. in.



PATENTED FLANGE IS DISTORTION-PROOF

Strains due to uneven or excessive bolt tightening are absorbed in recessed area (A) and cannot be transferred to flange gasket face (B). Outer flange rim lip (C) acts as "stop" to prevent excessive drawing up of bolts.

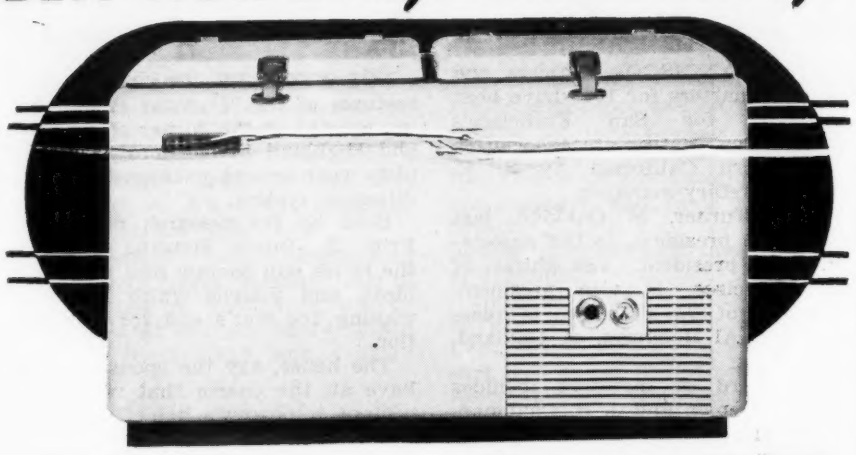
PATENTED SPRING DESIGN PREVENTS BY-PASSING

The strong spring (A) provides positive tight sealing action of screen cartridge collar on end of shell (B), thereby preventing by-passing of the refrigerant between outside of screen cartridge and inner surface of strainer.

HENRY VALVE COMPANY 3260 WEST GRAND AVENUE, CHICAGO 51, ILL.

PACKLESS AND PACKED VALVES · STRAINERS · DRYERS FOR REFRIGERATION AND AIR CONDITIONING
AMMONIA VALVES · FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

BEN-HUR *Brings Better Living!*



Home-frozen foods will bring better living to added thousands of American homes. Up-to-date home planning demands the convenience and satisfaction of a BEN-HUR Farm and Home Freezer in utility room, kitchen, or basement.

Ben-Hur Dealers are in direct line to *profit* by today's widespread popular demand for dependable Freezers. A BEN-HUR Dealership will increase your customer-prestige and profits. Write regarding franchises still available.

BEN-HUR MFG. CO.
324 East Keefe Ave., Milwaukee 12, Wis.
Continuous Manufacturing Since 1911

Here are the "Stand-Out" Features of the Quality-Built BEN-HUR...

★ ALL STEEL CONSTRUCTION
★ LIFETIME TESTED
★ FOOD SURROUNDED BY COLD
★ SIZE FOR EVERY FAMILY
★ THICK INSULATION (Hermetically Sealed)
★ MODERN DESIGN
★ ECONOMY-ENGINEERED
★ INSULATED AGAINST POWER FAILURE

BEN-HUR FARM & HOME FREEZERS

Eureka Williams Corp. Name Is Approved

DETROIT—Stockholders of Eureka Vacuum Cleaner Co. have okayed the proposed change of the company's name to Eureka Williams Corp.

H. W. Burritt, president, declared that the new name better represents the Eureka and Williams divisions of the company, which came into being after the merger last year of Williams Oil-O-Matic Heating Corp. with Eureka. Mr. Burritt said that production will be stepped up beyond prewar levels in both divisions of the company.

Range Manufacturers To Get Price Relief

WASHINGTON, D. C.—Range and heating stove manufacturers who produce a line of articles with a "well established pattern of price differentials between each of the models in the line," are permitted a certain measure of price relief through a new amendment to MPR 64, which became effective Jan. 19, OPA has announced.

Such a manufacturer "whose price structure and merchandising plan would be seriously disturbed by price adjustments on the basis of the individual costs of the articles for which he has qualified for adjustment," may make "an equivalent uniform percentage adjustment of the prices of all the articles in the line," OPA ruled.

The ruling is covered in Amendment 3 to MPR 64.

Case Dealer Assns. - -

(Concluded from Page 1, Column 2)

a discussion of the pro's and con's of such a group. When this group has decided favorably on the organization, each individual agrees to invite to a second meeting one or two other distributors or dealers. Experience has shown that at the second meeting it has generally been possible to form a permanent organization.

Between the first and second meetings, the local groups in the process of formation have found it helpful to contact Paul H. Sullivan, executive secretary of the Commercial Refrigerator Manufacturers Association with offices at 111 W. Washington St., Chicago, giving him a list of those who will attend the second meeting. Mr. Sullivan in turn offers his suggestion on a set of by-laws and offers the encouragement of the whole-hearted backing of the C.R.M.A. to the venture.

MEETINGS AND OFFICERS

Once the organization has been formed, it has been found important to provide for a meeting once each month, and the most satisfactory arrangement has been found to be a luncheon meeting. When meetings have been set for an evening, attendance has been too often made a matter of convenience with unsatisfactory results, it is reported.

While it has been the general practice to appoint a president or general chairman for a year in each organization, some have found it desirable to have a different temporary chairman to preside at each meeting, for this gives each member a chance to take an active part in the handling of a program, and has been instrumental in creating wider interest.

The objective aimed at in the formation of each commercial refrigerator dealers' organization is—

1) To set up a code of ethics.

2) To formulate sound business operating standards of practice.

Says one manufacturer of the development of these local organizations:

MANUFACTURER CITES PROBLEMS

"The commercial refrigerator dealer or distributor has grown up much like Topsy. The field consists of a conglomerate group of men who have carried over from the old specialty days, along with refrigeration service men who have added commercial refrigerators as a sideline, together with those who have come into the business from various fields because they have been able to see a future in it.

"In the growth of this distributor organization there has been at no time a program for the establishment of ethics between distributors, nor has there been a general understanding of the application of business practices necessary to success.

"Result of this situation has been the establishment of "dog eat dog" practices to include excessive and fictitious trade-in allowances, price cutting, and unnecessary knocking of competitors, which has given the commercial refrigerator industry a bad reputation at the distributor level.

"The future of the business is bright. A distributorship or dealership offers a fine opportunity to men of ability and financial means. The service which this industry at the distributor level can render to the ultimate users of equipment is one that calls for a high type of operator who is conscious of his responsibilities and capable of living up to them.

"The manufacturers are, of course, responsible for the situation which exists at the distributor level. These manufacturers have not been careful in their selection of outlets, and neither have they carried through their responsibility for educating distributors up to the standards required.

"Manufacturers in the past have often encouraged the wrong people to get into the business through consignment of merchandise, payment of rent or overhead or other subsidies which were not called for or required by the outlet properly qualified for the job.

"Manufacturers, too, have blinded themselves to the bad selling practices in the field, and in fact have often been guilty of encouraging these practices in instances where they thought it might mean an extra sale for the factory.

"Members of C.R.M.A. are today aware of the need for changing this situation, and therefore are making a conscientious and concerted effort to bring about an improvement in the entire commercial refrigerator distributing setup.

"While the manufacturers will, of course, have to correct the source of the trouble by cleaning out the weak and inefficient operators and by the appointment of sound operators, and through the carrying out of an educational program to educate distributors to the business standards required for success, it is believed that an immediate improvement can be made through the formation of local groups.

"These groups can improve each local situation, and in turn may help to force those manufacturers who do not get behind the overall program to take positive and proper action."

In McQuay Post

C. L. BENSEN

Who has been named manager of the Refrigeration Division of McQuay, Inc.

New York Association Formed by Dealers

NEW YORK CITY—The Commercial Refrigerator Distributing Association of New York, composed of the major commercial refrigerated fixture sales outlets in the area, was formally organized in a special meeting here Jan. 9.

Officers elected for the current year were: President—W. O. Crabtree, Jr., Hussmann Refrigeration, Inc.; Vice President—J. M. Woolridge, Seeger Refrigerator Co.; Secretary—Joseph S. Lipack, Super-Cold New York, Inc.; and Treasurer—Harry Culbertson, McCray Refrigerator Co.

In addition to Messrs, Crabtree, Woolridge, and Lipack, the Board of Directors includes Charles Q. Sherman, Weber Showcase & Fixture Co.; John Poth, Tyler Fixture Corp.; and Clayton E. Webb, of The Warren Co.

The group was organized under the sponsorship of Commercial Refrigerator Manufacturers Association, in line with that organization's nationwide program as announced in an earlier issue of AIR CONDITIONING & REFRIGERATION NEWS. It was voted to hold supper meetings regularly hereafter on the first Monday of each month.

Bendix Employs Two Project Engineers

SOUTH BEND, Ind.—Employment of two project engineers, George E. Mintner and Carl O. Penn, was announced by A. R. Constantine, vice president and director of engineering of Bendix Home Appliances, Inc.

A veteran of both the army and navy, Mr. Mintner was discharged as a lieutenant commander. He is a gas engineer formerly employed by the American Gas Association testing laboratories and the Patrol Valve Co., Cleveland.

During the war, Mr. Penn was assistant electrical engineer for the Indiana Ordnance Works at Charlestown and on the mechanical research staff of the Hoover Co., North Canton, Ohio.

Both men graduated from Purdue university engineering school in 1933.

BUILT for HEAVY LOADS---SEVERE USAGE

UNIVERSAL COOLER'S HERMETIC REFRIGERATING UNITS

Not every refrigerating unit will stand up under the severe usage and heavy loads that many refrigeration installations impose. But Universal Cooler "Case-Welded" Hermetic Refrigerating Units will — because they're designed and built, right down to the last detail, to do just that.

Take the connecting rod bearing in these outstanding new Hermetics as an example. They are made of Phosphor Bronze, an excellent anti-friction material that will take lots of hard usage and heavy loads with negligible wear over long periods of operation. Beginning with the preparation of the molten metal from which the parts are cast, through the last machine operation, accurate inspection controls insure exactly the same material and the same perfect weight and balance of every part produced. In addition, precise machining methods employed in making these parts is still another Universal Cooler assurance of high quality, long life, durability and real performance in the condensing units.

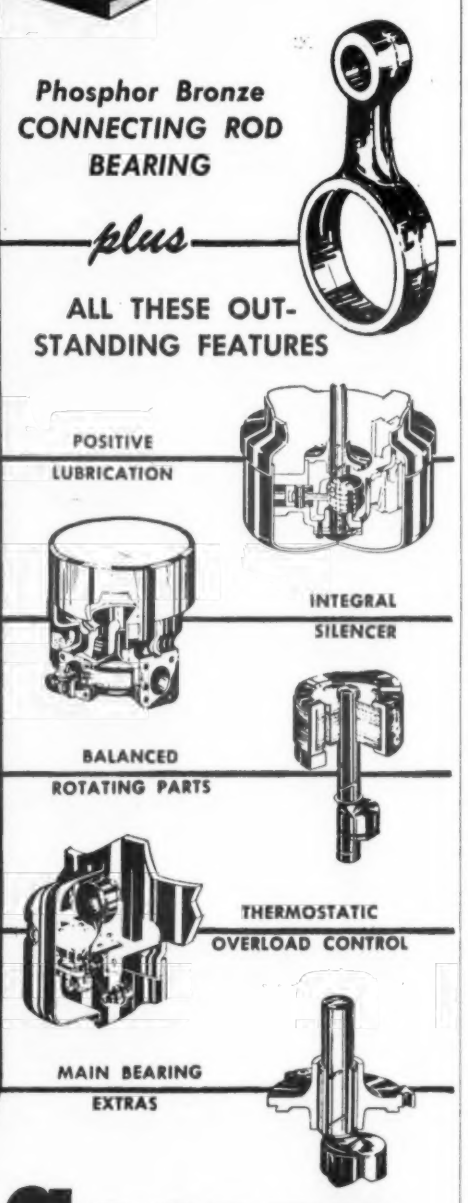
If you're looking for a refrigerating unit that will provide economical, long-life service under the most difficult operating conditions, you'll want to know the complete story of Universal Cooler's Hermetic Refrigerating Units. Write today, without obligation . . . learn why leading refrigeration manufacturers are saying:

"Let's Buy Universal Cooler"

Phosphor Bronze **CONNECTING ROD BEARING**

plus

ALL THESE OUTSTANDING FEATURES



UNIVERSAL COOLER
AUTOMOTIVE SINCE 1922 — WE SELL TO MANUFACTURERS ONLY

DIVISION INTERNATIONAL DETROLA CORPORATION
MARION, OHIO • BRANTFORD, ONTARIO

'Face-Lifting' Given To Carrier Catalogs

SYRACUSE, N. Y.—The dream of many an industrial advertising manager—that of "wiping the slate clean" of his company's old catalogs and establishing a new, unified "face-lifted" line—became a reality recently for Leslie M. Beals of Carrier Corp.

Carrier's decision to scrap its prewar catalog formats and produce a complete and integrated line of 36 catalogs from scratch was revealed when Mr. Beale, director of advertising and sales promotion of the Syracuse, N. Y., air conditioning and refrigeration equipment company, announced release of the first catalog in the new series, "Air Conditioning for Multi-Room Buildings."

Functionally, the new Carrier catalogs fall into two groups: product catalogs which emphasize the feature of given lines of equipment, and market catalogs which dramatize the corporation's ability to serve specific markets.

In both groups, high visual interest is maintained through economy of text and the employment of advanced techniques in illustration, charting, and the use of color and shapes for quick comprehension. Each type of catalog contains a novel index or selector guide, so that the reader may learn quickly where, when, and why Carrier products should be used.

The "Multi-Room Building Catalog," for instance, charts differences between the five Carrier systems of air conditioning hotels, hospitals, apartment buildings, and office buildings. This information is keyed, in turn, to those pages where complete information on each system is available.

Groundwork for these catalogs was laid more than a year ago, according to Mr. Beals. Carrier markets were analyzed and evaluated, and the corporation's products were studied and grouped from a promotional standpoint.

Covers and colors of each catalog group are different, to avoid confusion, but a proper family resemblance has been maintained. Market catalog covers feature prize-winning U. S. photographs, are printed in blue, black, and olive. Product catalog covers display equipment silhouettes, and are printed in blue, black, and rose.

In both cases, two colors are used on alternate spreads to give a 3-color effect at the cost of 2-color work.

The unusual job of design was done by Taylor Poore of Chicago. Type was set by Poole Brothers of Chicago. The printed pieces are being produced by the Case-Hoyt Corp., Rochester, N. Y.

Cooled 'Cattle Cars' Urged for Subways

NEW YORK CITY—The Citizens' Transit Committee, envious of the travel facilities afforded cattle, would like to transfer this city's subway riders from the present sardine-can-type of cars to modern, air conditioned vehicles.

The committee, described as a non-partisan group agitating for an increased subway fare, thinks the air conditioned cars and other improvements might be made possible by a boost in the current nickel fee. Undiscouraged by two rebuffs, the committee says it is again going to submit to the 1946 Legislature a proposal that a Transit Authority be formed to take over and operate the city's transit system at a fare of not more than 10 cents.

It is the opinion of the committee that riders now "travel worse than cattle."

It is the opinion of New York's Board of Transportation, however, that air conditioned subway cars are not just around the corner.

Thompson Morrison Returns To Morrison Products

CLEVELAND — Thompson Morrison, a lieutenant commander in the Navy until his recent discharge, has resumed his duties as vice president and sales manager of Morrison Products, Inc., manufacturer of blower wheels and other products, it was announced recently.

Westinghouse Redesigns Conditioners To Cut Down Weight, Space, Noise

EAST PITTSBURGH, Pa. — Restyled to keep pace with store modernization programs, the new Westinghouse package air conditioner line has also been redesigned to obtain quieter, more versatile operation, while at the same time cutting down on weight and space requirements, the company announces.

Air conditioning for the small shop, shoe store, delicatessen, or dining room was fast becoming a must before the war sidetracked the growing application, says Westinghouse. The air conditioning of these establishments is usually done by cabinet-type units of from 1 to 5-hp. capacity.

With this experience to build on, Westinghouse engineers have redesigned these units with several resulting benefits. Commercial artists have had their say as to exterior appearance, a matter of importance in postwar shop remodeling.

This self-contained unit, especially designed for use within the space to be air conditioned where floor area is held at a premium, has been reduced up to 15% in size. Weight of the 5-hp. size is reduced 20%, which makes for easier installation.

All component parts are mounted on a rigid structural chassis with panels readily removable to facilitate easy inspection and servicing without the necessity of moving the entire unit, the company says.

The air supply grille that distributes the conditioned air throughout the space is interchangeable to permit either vertical or horizontal airflow. This feature eliminates ductwork in many installations and provides for better air distribution.

The blower-type fan which circulates the conditioned air, incorporates features of both the propeller and centrifugal fan and requires less power from the fan motor, it is said.

The hermetically sealed refrigeration compressor has been completely redesigned for the 2, 3, and 5-hp. models. The cylinders are now arranged in a 90° vee and the rotating parts dynamically balanced for smoothness. Quieter operation is obtained by the increased use of cast iron in place of the steel shell which previously enclosed the compressor.

In two of the prewar models, two compressors were used. Now only one of the newly designed higher capacity compressors is necessary.

Alton Receives Prices on 4 Evaporative Coolers

DALLAS, Tex.—Maximum prices for sales of four models of evaporative coolers manufactured by Alton Co. here are contained in Order 202, MPR 591, recently made public by OPA.

Highest priced of the non-mechanical air conditioners is No. DM 1006, which is $512 to consumers, $256 to distributors, and $308 to dealers. Next highest is No. DM 706, with ceilings of $400 to consumers, $200 to distributors, and $240 to dealers.

No. DM 556 has a top price of $294 to consumers, $147 to distributors, and $177 to dealers. Retail ceiling of No. DM 406 is $212; $106 is the authorized ceiling on sales to distributors, and $128 is the limit on sales to dealers.

"Come and Get It!"

Thanks to speedy reconversion, PEERLESS OF AMERICA, Inc., can now say: "Come and Get It!" We're ready for your orders for immediate shipment on many PEERLESS products, the products of known leadership your customers are waiting for. Shown above are the PEERLESS Flash Cooler, Ice Cube Makers, Fin Coil, and Off-Center Coil. Also in production are PEERLESS Capacity Boosters and Expansion Valves. They're all rolling off the lines. Come and get 'em!

Sold through leading refrigeration supply jobbers.

PEERLESS OF AMERICA, INC.
EXECUTIVE and GENERAL SALES OFFICES
333 N. MICHIGAN AVENUE, CHICAGO 1, ILLINOIS, U. S. A.

New Washer Prices

Bendix Home Laundry

SOUTH BEND, Ind.—Increases of $10 over the retail ceiling prices previously approved by OPA for the standard and deluxe models of the Bendix Automatic Home Laundry are authorized in Amendment 1 to Order 23, MPR 86.

New ceiling prices for sales by dealers to consumers are:

Model	Zone 1	Zone 2	Zone 3
Standard automatic	$169.50	$172.50	$179.50
Deluxe automatic	189.50	192.50	199.50

These prices include delivery and installation. The amendment defines installation as including "setting up the machine and bolting it to the floor; making the hot and cold water connections; and providing two ½-inch shut-off valves, and two pieces of rubber hose, each up to 4 feet in length, for water lines, and up to 5 feet of drain hose, and up to 5 feet of wire for connection to electric facilities provided by the purchaser."

Thor Automagic

CHICAGO—OPA has fixed maximum retail prices of the Thor Automagic dishwasher, Model 200D, manufactured by Hurley Machine Division of Electric Household Utilities Corp. at $149.50 in Zone 1, $155.50 in Zone 2, and $157.50 in Zone 3.

For sales and deliveries of the dishwasher by the manufacturer to distributors, the ceiling was set at $74.75, f.o.b. the factory. The ceilings on sales and deliveries to dealers by the producer are $94.10 in Zone 1, $97.25 in Zone 2, and $99.14 in Zone 3, f.o.b. the manufacturer's branch warehouse.

Distributors' prices to dealers were pegged, in order of zones, at $94.10, $97.25, and $99.14.

These prices were established by Order 4787, MPR 188, which stipulates that if the manufacturer wishes to make sales and deliveries to any other class of purchaser or on any other terms and conditions of sale, he must apply to OPA under the Fourth Pricing Method of MPR 183 for authorization.

Nineteen Hundred Corp.

ST. JOSEPH, Mich.—Nine models of wringer-type washing machines manufactured by Nineteen Hundred Corp. here will retail at ceiling prices ranging from $59.95 to $119.95, according to Order 30, MPR 86, recently issued by OPA.

The order also fixes dealers' ceiling prices to consumers for two models of Nineteen Hundred ironers. These ceilings vary from $84.95 to $109.95.

Maximum retail ceilings for the ironers were established as follows, in order of zones (1, 2, and 3): Model 61640, $84.95, $89.95, $94.95; Model 61660, $99.95, $104.95, $109.95.

Section 15 of MPR 86 governs the ceiling prices of sales to dealers by distributors.

Following is the schedule on retail sales of the washing machines:

Model	Zone 1	Zone 2	Zone 3
52230	$ 69.95	$ 74.95	$ 79.95
61120	59.95	64.95	69.95
61220	69.95	74.95	79.95
61320	94.95	99.95	104.95
61140	74.95	79.95	84.95
61240	84.95	89.95	94.95
61250	94.95	99.95	104.95
61160	99.95	104.95	109.95
61260	109.95	114.95	119.95

Conlon Corp.

CHICAGO—Authorization for Conlon Corp. here to increase ceiling prices of eight models of washing machines and four models if ironers by 9.3% instead of 7.7% as provided in MPR 86 was recently given by OPA in a price adjustment order.

At the same time, OPA granted a boost of 6.4% instead of 4.9% for distributors pricing under rules five and six of section 15 (MPR 86). These adjustments were announced in Order 26 under Supplementary Order 119.

Order 26 also established the following maximum retail prices for the washers and ironers in order of zones (1, 2, and 3):

Washers: 19P—$106.50, $111.50, $116.50; 19—$96.50, $101.50, $160.50; 17P—$101.50, $106.50, $111.50; 17—$91.50, $96.50, $101.50; 39 SP—$101.50, $106.50, $111.50; 39 S—$91.50, $96.50, $101.50; 15 P—$91.50, $96.50, $101.50; and 15—$81.50, $86.50, $91.50.

Ceiling prices to consumers for the ironer models are: R 100—$126.95, $131.95, $136.95; C 76—$111.95, $116.95, $121.95; C 98—$121.95, $126.95, $131.95; R 87—$116.95, $121.95, $126.95.

The manufacturer will determine his ceiling prices in accordance with the provisions of sections three and five of MPR 86, the order states, "except that he shall increase his ceiling prices for each model by 9.3% instead of 7.7% as provided in section 5."

Section 15 of MPR 86 will govern distributors' top prices to dealers "except that each distributor pricing under Rules 5 or 6 of that section shall increase the highest price charged by him for the same machine (or for a model differing from it by minor changes only and priced under section 6 of Maximum Price Regulation No. 86) by 6.4% instead of 4.9% as provided in section 15," according to the order.

Automatic Washer Co.

NEWTON, Iowa—Automatic Washer Co. here has been given OPA's ceiling prices for sales of 15 models of its wringer-type and spinner-type washing machines.

Order 32 under MPR 86 contains the following retail prices for eight models of Automatic's wringer-type machines:

Model	Zone 1	Zone 2	Zone 3
410	$ 49.95	$ 54.95	$ 59.95
451	59.95	64.95	69.95
412	64.95	69.95	74.95
453	74.95	79.95	84.95
4178	74.95	79.95	84.95
4179	84.95	89.95	94.95
417	104.95	109.95	114.95
459	99.95	104.95	109.95

Five other models of the wringer-type units are priced the same in all zones. These models and prices are: W-15, $54.95; W-16, $69.95; W-17 and W-18, $79.95; and W-19, $89.95.

Maximum prices for two models of the spinner-type machines were set as follows, by zones: Model 85, $104.95, $109.95, $114.95; Model 86, $114.95, $119.95, $124.95.

For sales by distributors to dealers, the prices for the eight models of wringer-type machines were fixed as follows:

Model	Zone 1	Zone 2	Zone 3
410	$32.67	$36.63	$39.95
451	41.95	45.50	48.97
412	43.30	46.63	49.95
453	49.95	53.30	56.67
4178	49.95	53.30	56.67
4179	56.67	59.95	63.95
417	69.97	73.28	76.63
459	66.63	69.97	73.28

Uniform distributor-dealer ceilings for the other wringer-type washers are: W-15, $38.42; W-16, $48.91; W-17, $55.91; W-18, $62.37; W-19, $70.46.

Dealers will pay $69.97 (Zone 1), $73.28 (Zone 2), and $76.63 (Zone 3) for Model 85 and $73.28, $76.63, and $79.97 for Model 86, both the spinner-type.

All prices on sales by distributors to dealers are f.o.b. the seller's city, according to the order. However, when shipment is made directly from the factory to the dealer pursuant to the distributor's order, the prices are f.o.b. the dealer's place of business.

Speed Queen

RIPON, Wis.—Retail ceiling prices previously announced by OPA for eight models of Speed Queen wringer-type washing machines manufactured by Barlow & Seelig Mfg. Co. here were reduced by $5, according to Revised Order 1, MPR 86, recently issued by the agency.

Under the revised and amended order, dealers' ceiling prices to consumers are:

Model	Zone 1 Each	Zone 2 Each	Zone 3 Each
800	$ 94.95	$ 99.95	$104.95
700	84.95	89.95	94.95
600	74.95	79.95	84.95
500	64.95	69.95	74.95
400	54.95	59.95	64.95
700X	104.95	109.95	114.95
600X	94.95	99.95	104.95
500X	84.95	89.95	94.95

Section 15 of MPR 86 governs determination of distributors' prices to dealers, the order states.

OPA said it would allow addition of $5 for a waterpump, $5 for a direct current motor, and $2.50 for an odd frequency motor if, at the request of a purchaser, a dealer sells any of the eight models with any of these items of optional equipment.

Barton and Whitehouse

WEST BEND, Wis.—Barton Corp. here is authorized to retail 13 types of its Barton and Whitehouse wringer-variety washing machines at ceiling prices ranging from $39.95 to $109.95 under the provisions of Order 28, MPR 86, recently issued by OPA.

The price schedule for sales by dealers follows:

Barton Model	Zone 1	Zone 2	Zone 3
10	$39.95	$ 44.95	$ 49.95
20	49.95	54.95	59.95
31	54.95	59.95	64.95
R-41	59.95	64.95	69.95
R-61	69.95	74.95	79.95
R-61-S	79.95	84.95	89.95
C-61	79.95	84.95	89.95
C-61-S	89.95	94.95	99.95
C-71-S	99.95	104.95	109.95

Whitehouse Model	Zone 1	Zone 2	Zone 3
10	$39.95	.....	.....
31	49.95	.....	.....
R-61	59.95	.....	.....
C-61-S	69.95	.....	.....

The order directs distributors to determine their prices to dealers in accordance with Section 15 of MPR 86.

Addition of $10, if a machine is equipped with a water pump, and of $25, if driven by a gasoline motor instead of an electric one, are permitted by the order.

Mail Order Houses Can Skip Tagging Order

WASHINGTON, D. C.—Tagging and invoice requirements to show ceiling prices of household washers and ironers do not apply to mail order houses shipping directly to consumers if the catalogs state that prices listed therein do not exceed ceiling prices, according to a recent OPA ruling.

When washers and ironers are sold through a retail outlet of a mail order house, they must carry the standard price tag, however, OPA points out.

Mail order houses selling washing and ironing machines specially manufactured for them under a brand name owned by them are responsible for calculation of the retail ceiling price, OPA has ruled. In all other instances, the manufacturer must calculate the price.

These rulings are covered in Order No. 24 under Maximum Price Regulation No. 86.

OPPORTUNITY (Distributorship)

Prominent Mid-Western Manufacturer of Electronic Air Sterilizing Equipment now ready to appoint distributors for several territories.

Only progressive organization considered, that is now operating in commercial refrigeration or allied fields contacting meat markets, packers, restaurants, hotels, etc. Products nationally advertised—nationally sold. Must have ample reserve to set up and maintain aggressive sales force and invest in merchandise.

Write immediately full details including address and telephone number. Company executive will be in city to arrange interview.

Box 1906, Air Conditioning & Refrigeration News

WOMEN KNOW THE VALUE OF

BONDERIZING

FOR FINISH PROTECTION

For many years homemakers have been in close personal touch with Bonderizing—rubbing elbows with it in their daily work. They knew when they made the purchase that the hidden quality of Bonderizing was under the enamel keeping their refrigerators, washing machines, air conditioning equipment, and other familiar household units, bright, shining, protected from rust.

Bonderizing has had a very important war job to do. With this over, Bonderizing returns to peacetime service—assuring finish protection for our most important steel household equipment.

PARKER RUST PROOF COMPANY
2170 E. Milwaukee, Detroit 11, Mich.

BONDERIZING • PARKERIZING • PARCO LUBRIZING
HOLDS PAINT TO STEEL — INHIBITS RUST — RETARDS WEAR

PARKER PRODUCTS CONQUER RUST

A DESIRABLE CONNECTION—

TYLER DISTRIBUTORS are going to town with a complete line of up-to-the-minute welded steel Commercial Refrigerators—*plus* a complete line of Harder-Freez Home Lockers.

Tyler units are nationally recognized for sound engineering, appealing beauty, practical features and outstanding value. Tyler and Tyler distributors have made steady progress for almost twenty years. Tie up with Tyler—today!

TYLER

TYLER FIXTURE CORP., NILES, MICH.

The Way To a Woman's Heart?

The way to a woman's heart can be through an appeal to her delight in new types of foods, Freezers, Inc., of Minneapolis found out in the response they got when they sent out surprise gifts of frozen dinners as Christmas gifts. The gifts were attractively wrapped in oversize hat boxes as shown here.

* * *

Coast Firm Plans Oregon Frozen Food Plant

ONTARIO, Ore. — The Frozen Foods Division of the Bridgeford Co., 808 Imperial Ave., San Diego, Calif., will build a quick-freeze plant in Ontario, Ore. Designed by L. Bartholomew, of Salem, Ore., the quick-freeze plant will be 150 x 410 ft. in area, and will cost an estimated $750,000, according to a recent announcement.

Freezers, Inc., Presents Twin-City Housewives With Unique Gift

MINNEAPOLIS — Unique promotion idea worked out between Freezers, Inc., newly opened frozen foods store in Minneapolis, and Radio Station KSTP, Minneapolis-St. Paul, had the latter sending out more than 150 complete frozen dinners as Christmas gifts.

The frozen dinners, first ever distributed in the Twin Cities, were delivered in one day via refrigerated truck. They went to KSTP clientele, and excited enthusiastic comment from nearly every recipient. Stunt even found its way into the columns of Virginia Safford, feature writer on the *Minneapolis Star-Journal.*

Letters and phone calls to the radio station and to Freezers, Inc.—who will follow up the names of the dinner recipients with direct mail advertising elaborating on their services—testified to the success of the promotion for the newly opened store.

Idea is being circulated by Freezers, Inc., among other members of the Frozen Foods Consumers Institute. It is felt that the stunt opens up a new line of promotion for frozen food stores—frozen, precooked meals for varied gift giving such as on birthdays, holidays, etc.

KSTP dinners were for six persons, and included shrimp cocktail, French onion soup with croutons and Parmesan cheese, spaghetti with meat balls and sauce, broccoli, cloverleaf rolls, angel food cake, and vanilla ice cream. Dual-purpose exterior packaging housed the dinners, the station having special, large ladies' hat boxes made for the purpose. Each package then was wrapped in gleaming cellophane and done up with a shiny red bow. Included with each was a specially printed menu.

Recipients of the dinners were notified, by KSTP, a week in advance of the delivery date, in order that those without home freezer facilities could plan to make use of the food before it thawed.

Frozen Cod Production To Reach New High

ST. JOHN'S, Newfoundland—Fresh frozen cod-fillet production this season will continue recent upward trends by topping 30,000,000 pounds, it is anticipated by the Newfoundland Fisheries Board.

The 1944 production of about 24,000,000 pounds approximately doubled that for the previous year.

Fire destroyed a large, modern freezing plant in Harbor Grace a few days after going into operation, but it has been rebuilt and is already in production, it is reported.

An innovation in the field is the use of ship-to-shore radiotelephones enabling ship captains to contact owners and refrigerating plants. The installations are employed to prevent temporary overloading of plants by allowing banking vessels to arrive at staggered hours.

British Columbia Firm Will Quick Freeze

VICTORIA, B. C., Canada — Construction of an addition to the cold storage plant at J. H. Todd & Sons, Ltd., Victoria, B. C., will be started immediately. Permit has been taken out for the work, which will cost $35,000, and contract has been given to D. Burnett, Victoria. L. B. Bing, manager of the J. H. Todd company, states his firm is expanding its operations in the fish and frozen fish field, and is planning to install quick freezing equipment in the cold storage plant.

Big Market Revealed In 'Official' Jersey Survey

TRENTON, N. J.—A survey conducted by the New Jersey State Department of Economic Development indicates that one or more household appliances will be bought by each of 900,000 families in New Jersey within the next six months or as soon as they become available.

Economic Development Commissioner Charles R. Erdman, Jr., explained the estimate was based on a statewide poll of 10,000 residents representing every employment classification.

Refrigerators will be purchased by 209,877 New Jersey families. New radios are wanted by 312,500 families, while washing machines are on the "must" list of 233,980 homes.

The survey found that 40% of the householders plan to pay cash from income for appliances, another 24% will use savings and investments, and 23% will utilize the instalment plan. The remaining 13% were uncertain.

New Home Freezer Prices

Wilson Industries, Inc.

NEW YORK CITY—Wilson Industries Co. here has been given OPA's ceiling price schedule for sales of its 10, 16, and 21-cu. ft. frozen food cabinets as established by Order 203, MPR 591.

A maximum retail price of $360 has been set for the 10-cu. ft. model, which is equipped with a ⅓-hp. condensing unit. Ceilings on sales to distributors and dealers are, respectively, $180 and $216.

For the 16-cu. ft. freezer, the ceilings are $560 to consumers, $280 to distributors, and $336 to dealers. This model has a condensing unit of ½-hp.

The 21-cu. ft. model, with a condensing unit of ¾ hp., has maximum prices of $660 (consumers), $330 (distributors), and $396 (dealers).

Calhoun Service

NEWTON, Iowa — Mannufactured by Calhoun Refrigeration Service here, a 10-cu. ft. home freezer powered by a ¼-hp. condensing unit will retail at $380, according to the provisions of Order 198, MPR 591, announced by OPA. Ceilings on sales to distributors and dealers are $190 and $288, respectively.

Ideal Cooler Co.

ST. LOUIS—A 20-cu. ft. frozen food cabinet manufactured by Ideal Cooler Co. here has ceiling prices of $620 to consumers, $310 to distributors, and $372 to dealers under the terms of OPA Order 200, MPR 591. The freezer has ½-hp. condensing unit.

Sub-Zero Freezer Co.

MADISON, Wis. — Ceiling prices for several models of coolers and freezers manufactured by Sub-Zero Freezer Co. here were recently established by OPA.

Order 199, MPR 591, authorizes the following prices on sales of these units:

Model	Distributors	Dealers	Consumers
No. 500—11 cu. ft., 1 door, less compressor and controls	$115	$138	$230
No. 500—11 cu. ft., 2 door, less compressor and controls	125	150	250
No. 700—15½ cu. ft. less compressor and controls	185	222	370
No. 900—18¾ cu. ft. less compressor and controls	217	260	434
"Aristocrat"—17½ cu. ft. less compressor and controls	200	240	400
"Aristocrat"—Model 6-8 Market Cooler 210 cu. ft.	450	540	900
"Aristocrat Jr."—9.5 cu. ft. ¼ hp. condensing unit	193	232	386
"Aristocrat Jr."—9.5 cu. ft. less compressor and controls	123	148	246
No. 13-7—21 cu. ft. ⅓ hp. condensing unit	300	360	600
No. 13-7—21 cu. ft. less compressor	230	276	460
No. 16-V—16 cu. ft. ¼ hp. condensing unit	260	312	520
No. 16-V—16 cu. ft. ½ hp. condensing unit	275	330	550
No. 16-V—16 cu. ft. less compressor	190	228	380

Dairies Everywhere Like FRICK Refrigeration

Sheffield Farms, New York

Chestnut Farms, Washington

Superior Dairies, St. Augustine

Central Ice Cream, Chicago

Carnation Milk, Tulsa

Lone Star, Houston

Adohr, Los Angeles

Because it sets the standards of dependability, convenience, and overall economy. Whether for cooling milk, freezing ice cream, keeping storage rooms cold, refrigerating trucks, making ice, or conditioning air, you'll find Frick equipment the choice of leading dairies throughout the country. Let us quote on YOUR cooling needs: write, wire or phone

WAYNESBORO, PENNA. U.S.A.
FRICK CO.
DEPENDABLE REFRIGERATION SINCE 1882

FREEZ-ALL OFFERS 3 BEST SELLERS

THIS IS THE 20° BELOW ZERO SHARP FREEZER
MODEL 160
16 cu. ft. Freez-All drawer type home food freezer.
MODEL 80
8 cu. ft. Freez-All drawer type home food freezer.
MODEL 60
6 cu. ft. Freez-All chest type home food sharp freezer.

Definite Reasons — WHY PEOPLE SAY- "I want a Freez-All"

Months of analysis, years of engineering and thousands of dollars spent in experimentation is the background of this complete line of Freez-All home food freezers. Nothing has been spared in making these models leaders in their field. From top to bottom all that is perfection in a home freezer is found in Freez-All. Customers can notice instantly the compelling features outstanding in the Freez-All complete line.

FREEZ-ALL

REFRIGERATION DIVISION
DEPT. 55
PORTABLE ELEVATOR MFG. CO
BLOOMINGTON, ILLINOIS

Record of 'Every Step' In Repair Work Precludes Complaints, Boosts Profits

By Ross Potter

PLYMOUTH, Mich. — Keeping a detailed record of every step taken in repairing appliances saves plenty of grief in your repair department, it has been the experience of at least one appliance dealer.

Kimbrough Electric has been the authorized General Electric outlet for Plymouth and its surrounding area since 1939. Richard L. Kimbrough, owner and manager, has been in the electrical supplies and repair business there since 1925, and the repair plan he follows is the gradual outcome of those years of experience.

"The plan isn't a new one," he says. "Anybody who's been in this business a while could tell you that. But it does work, and for say a veteran just starting his own shop, knowing the details really could save him a lot of headaches."

The basis of the plan is a complete step-by-step control of each appliance's course through the repair shop.

A repair call coming in by phone is taken down immediately on a triplicate 8½ x 11 form that asks for the customer's name and address, the phone number to be called when the appliance is ready, and any special instructions such as "Leave next door if not at home," or "Key under mat."

The customer is asked whether she thinks a service call at her home will be sufficient, and if so, the make and model of the appliance and what she believes to be wrong.

"She isn't always able to give very much information," Mr. Kimbrough says, "but when she is able to, it saves time all around."

If the appliance must be brought into the shop, the customer is told that if she can bring it in, it will save her transportation charges.

PICKUP CHARGES

The pickup charge varies with the distance that has to be covered and the size of the appliance itself. For small items from homes nearby, necessitating only one man and a few minutes' time, the charge is $1.

For calls from Farmington or Garden City, which can be more than 10 miles away, for a heavy appliance that needs two men to horse it into the truck, the charge may be as high as $8.

The figure in each instance covers both pickup and delivery.

Mr. Kimbrough believes strongly that this charge should be a separate item, and that the customer should be informed first thing.

Major appliances such as ranges and refrigerators might be pretty much out of the question, he acknowledges, but letting a customer know the score beforehand gives her at least a chance to save money if she can, and eliminates later resentment against a transportation charge.

Not to charge, on the other hand, means that the actual pickup and delivery costs have to be camou--flaged under "labor" or some other heading, leaving the dealer open to question whenever a customer asks for an itemized breakdown of the bill.

The form which is filled in for each appliance received is as complete as Mr. Kimbrough could make it. At the upper right is a short list showing the date the order was taken, the date for which it has been promised, and who wrote up the order. A final "completed" date is checked in when the shop reports the unit ready.

TELLS WHO DOES WHAT

At lower center is a "box" showing who picked up the unit, and who took it back. This is important when the dealer has an outside contractor handling his deliveries, which is the case here; or if a shop is big enough to have several trucks, which of his own men handled it.

The name of the repairman who worked on the unit also is entered. This list of signatures is seldom referred to, but there are times—as in cases of injury to the unit in handling, or a mixup in deliveries—when it can be very important.

Under these items in the box is an entry Mr. Kimbrough is planning to change in the next printing. It reads, "Customer's acceptance: I have inspected this repair work and have found it satisfactory. Signed: ....."

This item will be replaced by one short slug that will say, "Received by ....."

The point is that the customer seldom can tell whether the appliance is going to work satisfactorily merely by looking at it. To ask a suspicious soul to sign a statement like this just makes her "suspiciouser," he reports.

The purpose of the signature is to show that the customer has received the right appliance. Visual inspection is the thing for a repaired ring, he explains, or a pair of shoes, but for an appliance, performance is the thing.

HOW FORMS ARE FILED

All three copies of each order blank have a serial number printed in the upper right corner. After the order has been taken over the phone, all three copies are placed in an open temporary file, in this instance a holder commercially produced for phonograph records and retailing for a dollar.

The open file holds the copies in a succession of folders that indicate the unit's procedure through the repair shop.

Using a triplicate form means using two carbons, Mr. Kimbrough adds, and it took a little experimenting before they found the best combination on carbons. It works out like this:

On top is the customer's copy, the original penciled form, of ordinary white paper. Under it goes a sheet of typewriter carbon paper. Then the office copy, colored pink. Under that, a sheet of pencil carbon paper. On the bottom is the shop copy, heavy cream-colored cardboard that is attached to the appliance as soon as it comes into the shop.

Using typewriter carbons for both sheets gave too light an impression under a pencil, he reports. This kind of carbon seems to need a hard metallic sock to bring out its best points.

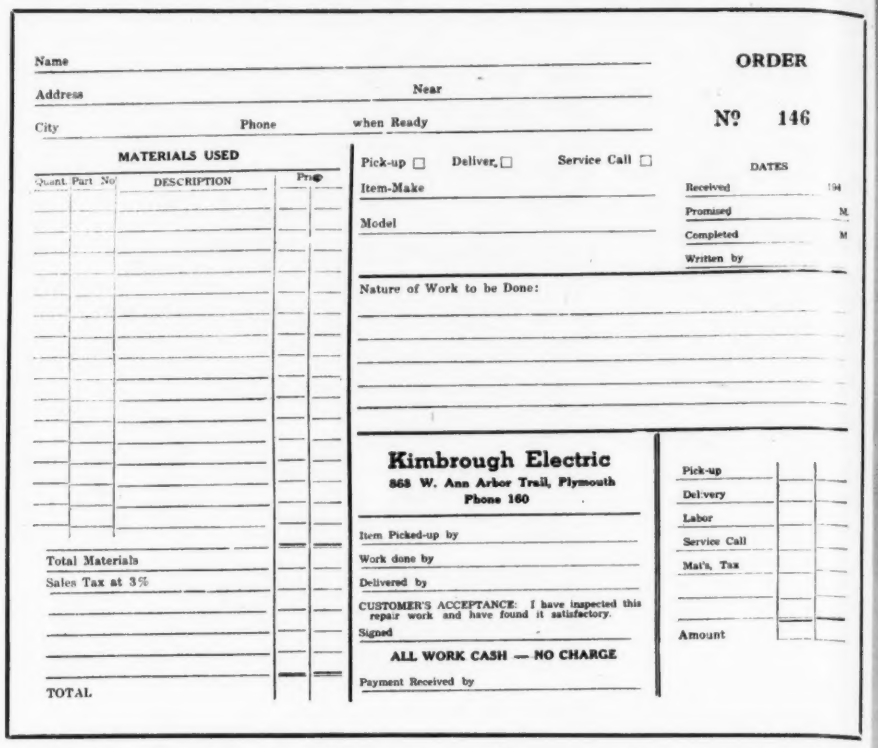
Using two pencil carbons, on the other hand, proved too thick, giving a fuzzy transcript on the third copy. The combination using one of each turned up the answer.

All three copies are held in the "New orders" folder until the unit comes into the shop. The "hard" copy stays with the appliance from then on; the other two copies move into the next folder, marked "In process."

When the repair job is finished, the two paper copies then are placed in the "Completed" folder until delivery of the unit. They go with it to meet the customer, and the office and shop copies return with her signature.

The office copy is filed alphabetically according to the customer's name. The shop copy goes into the shop file, where it is entered according to the number in the upper right corner.

Form For Repairs That Gives the Whole Story



Note that the form, in addition to providing space for a proper listing of all charges, also provides lines for information on the pickup and delivery, nature of work to be done, and the customer's signed acceptance of the work. Actual size of the form is 8½ inches high by 11 inches wide.

Honeywell provides the answer with the Polartron *System* of Automatic Defrosting Control. — Applicable to all "above freezing" fixtures the Polartron System provides for temperature "Cut-out" and Pressure "Cut-in" operation thus assuring positive defrosting at the end of each "on" cycle. Take advantage of the full capacity built into your refrigeration equipment — use the Polartron System. See your jobber for further details. Minneapolis-Honeywell Regulator Company 2659 Fourth Avenue South, Minneapolis 8, Minnesota. Branches and distributing offices in all principal cities.

MINNEAPOLIS oneywell CONTROL SYSTEMS

The Polartron System of FROST-FREE REFRIGERATION

STANGARD *Prime Surface* COLD PLATES For Maximum Refrigerating Efficiency

THE STANGARD-DICKERSON CORPORATION
46-76 Oliver Street • Newark 5, N. J.
STANGARD KNOWS REFRIGERATION

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844 Dealers In Western Pennsylvania Tell Their Plans for Merchandising

PITTSBURGH — Electrical appliances will be sold by 884 of the 981 dealers in western Pennsylvania surveyed by West Penn Power Co., and of this total 123 are outlets entering the home appliance field for the first time or re-entering after a temporary absence.

In the farm electric equipment field, 429 dealers definitely say they intend to be in the appliance business, while 114 dealers are undecided about including this line, the survey shows.

Breakdown of dealers in the territory surveyed by types of business was found to be as follows:

Chain Stores	1.2%
Department Stores	3.3
Electric Contractors	4.2
Plumbing & Heating	4.3
Automotive Stores	4.5
Variety Stores	5.9
Electric Service	9.7
Furniture Stores	11.2
Electric Specialty	11.3
Farm Equipment	12.0
Hardware Stores	12.1
All Others	20.3

Total dollar volume of 1941 electrical appliance and farm equipment sales by dealers in the West Penn territory is estimated by the company as approximately $14,232,000. How this volume was divided among various types of dealers is shown in the following table:

Electric Specialty	25.7%
Furniture	19.3
Hardware	8.7
Department Stores	7.0
National Chain	5.8
Automotive	4.9
Variety	3.7
Plumbing or Heating	3.3
Farm Equipment	2.9
Electric Contractor	2.8
Electric Service	1.2
Others	14.7

FEW WERE CASUALTIES

West Penn's survey revealed that a surprisingly small number of dealers in their territory were casualties of the war. This stability is in part due to the fact that dealers have been established for a long time and were financially able to weather the adverse wartime conditions, it was believed. Then, too, dealers leaned more heavily on other lines and also on appliance servicing.

Dealers in Electrical Business Prior to 1942:

5 years or less	22.1%
6 to 10 years	28.9
11 to 15 years	18.4
16 to 20 years	15.2
Over 20 years	15.4

By means of the survey, it has been ascertained by West Penn that dealers are now thinking about their future sales organizations. An increase of 68% in number of dealers planning to employ outside salesmen and a 79% increase in the number of salesmen they expect to employ are indicated.

When considered in the light of comparison with 1941, the present picture is something like this:

Number of dealers with outside salesmen in 1941	266
Number of dealers planning outside salesmen in future	446
Dealers undecided about use of salesmen	155

For those dealers already employing outside salesmen, the average number increased from 2.3% to 2.5% per dealer. This, says West Penn, calls for development of plans for recruiting, training, and compensation of salesmen.

GOOD SERVICE STRESSED

The fact that, to a greater extent, dealers recognize the importance of good service as an important element in a rounded dealership is confirmed by the survey in western Pennsylvania.

Of the dealers who plan to merchandise appliances and farm electric equipment, 524 or 53% had service departments in 1941, as compared with 67% who plan service departments in the future. A total of 76 dealers or 8% are undecided about maintaining a service department.

Wartime experience has shown that service departments can be operated at a profit, the survey reports. Proportion of dealers realizing a profit from service work at present is 27% greater than in 1941. In 1941, 52% of dealers profited from service work, and in 1944, 69%. This is due in part to a greater volume of service work, but also to better management, West Penn states.

The showing would be still better if more dealers would credit service revenue with amounts included in selling prices of refrigerators to cover five-year warranties, the company declared. Unprofitable operations declined from 123 in 1941 to 83 at present, a decrease of 33%.

Dealers' plans for improvement were also tabulated in the survey. Changes of location figure in the scheme of things for 15% of those surveyed, and another 10% are undecided. Remodeling of present quarters is planned by 40% and an additional 15% are considering it. As materials become available and selling days loom closer, dealers will hurry their moving and renovating plans, West Penn reports.

The refrigerator, washer, radio, and electric range were selected by dealers in that order as the four appliances to which they intend to give most sales push in the months and years ahead.

The home freezer shows the greatest increase of all appliances in dealer consideration. Following is a table showing the ratio between refrigerator and home freezer dealers in 1941 and in the immediate future:

Refrigerator Dealers in 1941	499
Refrigerator Dealers in Immediate Future	652
Home Freezer Dealers in 1941	32
Home Freezer Dealers in Immediate Future	471

West Penn feels that electric range figures are particularly significant, because they point up the great strides made in recent years by this item. A total of 401 dealers placed the electric range among the top four appliances as to postwar emphasis.

The following table shows how the number of electric range and water heater dealers now in operation stacks up with those operating in 1941:

Electric Range Dealers in 1941	444
Electric Range Dealers in Immediate Future	591
Water Heater Dealers in 1941	290
Water Heater Dealers in Immediate Future	454

West Penn cites a definite trend toward dealers handling complete lines of kitchen equipment. This is shown by the fact that, of the 392 dealers planning to sell kitchen cabinets in the immediate future, 371 also intend to sell electric ranges, and of the 225 dealers who will handle dishwashers, 219 also will be range dealers.

With continuing improvements in design and probable lower prices, sales of dishwashers are expected to rise, according to West Penn. There will be an increase of 108, or 92%, in the number of dealers handling dishwashers.

The number of garbage disposal dealers will rise from 61 to 140, and all but three of these dealers will also sell electric ranges.

Kitchen sinks were included in the list of items which dealers expect to sell. Of the 469 dealers who plan to handle this item, 440 will also sell electric ranges.

Dealers of kitchen sinks, kitchen cabinets, garbage disposals, and dishwashers in the future compare with those in 1941, as follows:

Kitchen Sink Dealers in 1941	400
Kitchen Sink Dealers in Immediate Future	460
Kitchen Cabinet Dealers in 1941	275
Kitchen Cabinet Dealers in Immediate Future	400
Disposal Dealers in 1941	60
Disposal Dealers in Immediate Future	150
Dishwasher Dealers in 1941	110
Dishwasher Dealers in Immediate Future	220

"One of a series of excerpts from the Hotpoint library of Planned Electrical Merchandising."

Window displays that SELL!

● A good window display for an appliance store stops people, interests them, and brings them right into the store. To do this, four things are essential:

1. Put the appliance itself in the window
2. Pick out an outstanding feature to spotlight
3. Tell what it is and how it works
4. Invite the customer to come in and see for herself

● For a window display of Hotpoint Automatic Electric Ranges that will sell, try this winner:

Place a Deluxe model range in the window. Paste a streamer across the window. On the streamer is this message: "Come in and see how this range cooks meals automatically."

Beside the Timer-Clock put this sign: "I am the Automatic Timer-Clock. I turn the oven on. I turn it off. I am the cook while you're gone."

At the side of the range nearest your entrance place this sign: "Step in and see how this great new convenience works."

● Try this "idea of the month" in your show window and watch it bring interested buyers into the store.

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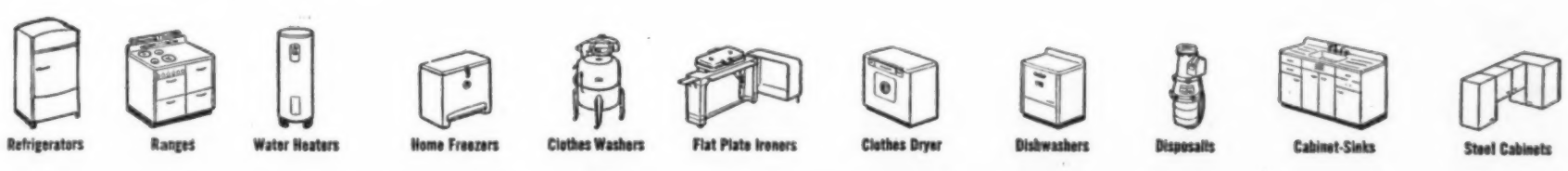
Hotpoint

Dependability Assured by 40 Years Experience!



More Dealers Than Prewar Will Sell, Demonstrate Complete Electric Kitchens

CHICAGO—Complete kitchen installations will be handled by 89% of electrical appliance dealers according to figures released. To secure information on postwar plants, 12,000 dealers were queried by Edison General Electric (Hotpoint) Appliance Co.

The survey was divided into four groups of questions concerned with: 1) the way dealers will display refrigerators, 2) attitude on trade-ins, 3) questions concerning home freezers, and 4) questions on "the type of store."

Figures tabulated up to Dec. 15, representing more than 20% of those receiving the survey, indicate that, while almost 90% of those answering "will install complete kitchens" for consumers, approximately one half will "display complete operating kitchens" in their showrooms.

That change in merchandising technique is the greatest single new development in postwar refrigeration selling, believes Floyd M. Slasor, manager, refrigerator sales division. Previously, dealers sold refrigerators mainly from straight model selection displays, he said.

Almost 30% of the dealers think that trade-ins will figure in less than 10% of refrigeration transactions in immediate postwar; although, another question of prewar experience brought the response that 30% of prewar sales included trade-ins.

A surprising 45% of those answering said that they would handle only one line of refrigerators, while at the other extreme, 13 dealers hopefully said that they would display nine different makes of refrigerators.

Saying that dealers are familiar with consumer thinking because of wartime close associations on service matters, Mr. Slasor asserted that he sought their opinions on the possible pattern of development of the market for home freezers. That question, bringing out that most dealers feel that home freezers have a limited appeal for city and town dwellers, headed a group of questions on that appliance.

Mr. Slasor pointed out that considerable new information developed by the survey was included in an approximate 1,000 "written-in" comments.

The 12,000 dealer list was selected from the 20,000 dealer mailing list receiving the company's home study course, "Planned Electrical Merchandising," before it was temporarily suspended with the August issue. Mr. Slasor said that the service would be resumed soon to Hotpoint franchised dealers.

The tabulated ballots indicate that more than 20% of those receiving the questionnaire are opening new stores. A majority of those dealers will use "operating kitchen display."

The No. 1 question: "Which way will you sell," brought the response that 58% will use the old-established "model selection" display method, in conjunction with a complete kitchen or "work-center" display, while only 25% will depend entirely upon straight "model selection" displays. That duplication of figures indicates that some dealers will have "complete kitchens" on display, but will continue the use of a line of models to make their sales, Mr. Slasor said.

"We are going to give the closest study to the many constructive comments brought in by this survey; they mean that dealers are thinking for themselves, and that means a healthy condition in our industry," the Hotpoint official said, adding, "we are pleased with the keen interest shown in complete kitchens. That means that the advice supplied by manufacturers and editors for the past several years has not been mis-directed.

On the question concerning trade-ins, 1,284 (53%) dealers said that they will be set up to "re-condition" old models, while 625 said that they would not offer that service, and 413 did not include an answer to that question. Mr. Slasor said that the large number of "no answer" is a result of a "waiting attitude."

"Most dealers appear to feel that a straight, no trade-in policy is the best merchandising bet for immediate postwar selling. Many commented that present boxes were worn beyond the point of good "reconditioning for resale."

Noting that dealers are less optimistic than some others in the industry concerning the market for home freezers, Mr. Slasor said that they would perhaps see more opportunity in that appliance when food purveying concerns once established home delivery routes for frozen products. Noting that a small group of 22 dealers had marked the questionnaire that 75% of all homes would buy the new devices, he said that his own estimate was closer to 25%.

Display--In a Complete Setting

Complete kitchen installations will be handled by 89% of a group of dealers answering a Hotpoint survey. Approximately 50% will have kitchens in their stores such as shown here with a woman attendant demonstrating the appliances while the salesman hovers in the background. Floyd M. Slasor, refrigeration sales division manager, Edison General Electric (Hotpoint) Appliance Co., takes the part of the salesman here while Miss Margaret Davidson, director of Hotpoint Institute, demonstrates the appliance.

Texas Department Store To Display Appliances In Separate Structure

FORT WORTH, Tex.—In line with the theme of "putting all appliances on the first floor," the Fair Department Store has started construction of a separate appliance building.

To handle all major appliances, quick-freezing equipment, home laundries, and water heaters, the new store is on a leased lot next door to the main building. Convenient parking space plus wide display windows are two main assets of the store, which is of "all-glass" construction.

Dimensions will be 18 x 36 ft. on the first floor, and a slightly smaller area on a mezzanine at the rear. Refrigerators, ranges, washing machines, and deep freezers will be shown on the street level while a complete electric kitchen, large enough for home economics demonstration, will be installed on the mezzanine.

"The store is so arranged that later on when necessity demands it we can handle trade-ins," C. E. Bateman, appliance buyer, stated. "Selling from a separate display of reconditioned refrigerators and washing machines behind the new-appliance section. Meanwhile we'll use all the facilities of the new building for promotion of complete all-electric kitchens, with regular cooking classes and dramatized exhibitions on our mezzanine."

Rudning-Robertson Co. To Have Own Building

SIOUX FALLS, S. D.—Rudning-Robertson Co., wholesale appliance firm, has purchased a corner lot at Second St. and Main Ave., this city. According to announcement by J. R. Rudning, the company will construct a one-story modern building on the lot to house its appliance business.

Regardless of how well planned and constructed your equipment may be, it must have proper control to assure efficient, satisfactory performance. Selection of just the correct controls for your needs is simplified by the *completeness* of the White-Rodgers line. Specify these accurate, dependable controls on all installations involving temperature or pressure. Predominantly used by manufacturers of refrigeration and air-conditioning equipment. Write for catalog and installation data.

WHITE-RODGERS ELECTRIC CO.
ST. LOUIS 6, MISSOURI
Controls for Refrigeration • Heating • Air Conditioning

PURO ELECTRIC WATER COOLERS
BRANCHES IN PRINCIPAL CITIES
MAIN OFFICE
440 LAFAYETTE ST.
New York 3, N. Y.
PURO FILTER CORP. OF AMERICA
DRINKING WATER SPECIALISTS FOR 40 YEARS.

MANHATTAN WHIPCORD F/HP V-BELTS
for satisfactory service
Important any time, but more so now. MANHATTAN Whipcord F/HP V-Belts keep home and store equipment running.
MORE POWER—grip the grooves, stop slips, uniform "pull."
LONGER LIFE—Endless cord construction resists internal heat and side wear.
SILENT RUNNING—Smooth and noiseless on high-speed drives.
THE MANHATTAN RUBBER MFG. DIVISION of Raybestos-Manhattan, Inc.
Executive Offices and Factories . . . Passaic, N. J.

WANTED

Well-known manufacturer of refrigerating and air conditioning products has openings for the following:

DESIGNERS AND APPLICATION ENGINEERS—Should be experienced in the industry.

DRAFTSMEN—Experience in the industry not essential.

METHODS ENGINEERS AND ESTIMATORS—Experienced in the stamping, forming, cutting and assembling of metal components. Excellent opportunity for permanent connection. Location Chicago. Give complete details of your experience, salary expected and when available.

Box 1887, Air Conditioning & Refrigeration News

Summary of Voluntary Comment In Hotpoint Survey

How Dealers Feel About Trade-Ins

Trade Ins	*No. of Comments*	*Per Cent*
No trade ins at present	3	2.8
No trade ins till one year from now	10	9.3
Hope to keep trade ins at a minimum	4	3.7
More trade ins later	10	9.3
Many old worn out models in this community cannot be repaired satisfactorily for resale	4	3.7
Competition will determine amount of trade ins	3	2.8
Don't believe we will have many trade ins	10	9.3
Trade ins will be necessary part of business	2	1.8
Trade ins are losses	5	4.6
Trade ins almost impossible on low margins	3	2.8
Ceilings must be maintained on trade ins	2	1.8
Present discounts will stiffle trade ins	9	8.3
Expect to junk most trade ins	8	7.4
Profits on refrigerators at present can't allow a dealer to trade	6	5.6
Do not intend to take trade ins	16	14.8
Will take no trade ins under OPA prices	9	8.3
Will sell trade ins to second hand dealer	4	3.7
		100.0%

Many Factors In Home Freezer Sales

Home Freezers	*No. of Comments*	*Per Cent*
Refrigerators complete in demand	128	39.9
Better homes want home freezers separate	6	1.9
Public needs to be educated on advantages of freezers	14	4.4
Freezer alone in demand	24	7.5
Price will control sale of refrigerator combination	16	5.1
Market over-estimated on combination and freezers	6	1.9
Farming area will go strong for freezers	53	16.5
Farming area large sizes predominate	10	3.1
Local locker plant	24	7.5
Refrigerators with large freezing complete	3	0.9
Deluxe models will be greater demand than a stripped box	1	0.3
Home freezers expensive	4	1.3
Farmer wants walk-in type refrigerator	2	0.6
Demand is for a refrigerator with a fairly good size freezing compartment	5	1.6
Believe lack of space will limit sales of freezers	3	0.9
Freezing compartment should be put in small refrigerators too	3	0.9
People want separate refrigerator	3	0.9
Make 4 foot freezer for city apartment	1	0.3
Middle aged will buy freezer complete but not young people	1	0.3
9 or 10 cubic feet farm freezers will sell very well	2	0.6
Most home freezers are too small for up-to-date farms, should be about 24 cubic feet	1	0.3
A 6 cubic foot with freezing compartments is what is needed	1	0.3
Home freezers are still a luxury item	1	0.3
Many people will not care to process food	1	0.3
A small unit 4 to 6 cubic feet will be in good demand	1	0.3
Farmers want 10 to 64 cubic feet farm freezers	1	0.3
2 cubic foot deep freeze complete in refrigerators seems to be popular trend	1	0.3
Home freezer with eye appeal and convenience will sell at ease	2	0.6
People who have refrigerators will buy freezers, new customers will buy combination	3	0.9
		100.0%

Comments Favor 'Complete Kitchen' Selling

Kitchen Installations	*No. of Comments*	*Per Cent*
We intend to sell many complete kitchens	7	35.0
Complete kitchen installation demonstration best for selling appliances	3	15.0
Complete kitchen installations involve too many parties such as plumber, carpenter, etc.	1	5.0
I find several who want complete kitchens	3	15.0
Selling merchandise from complete kitchen is not wise, especially refrigerators. Straight model selections are best. This keeps customer interested in what she wants to buy	2	10.0
A complete kitchen will enable salesmen to make larger sales with less time loss	1	5.0
Complete kitchen too high in cost for many sales	1	5.0
If complete units are so constructed as to make complicated installations dealers will leave them alone for contractors	2	10.0
		100.0%

Veterans Open Dealer Store in Red Bank, N. J.

RED BANK, N. J. — Showrooms and office have been opened here at 77 Monmouth St. by the Modern Home Appliance Co., which is specializing in Crosley refrigerators, Crosley, Emerson and Admiral radios, electric and gas ranges, sun lamps, vacuum cleaners, and General Electric's small appliances.

The new firm consists of Herbert Hecker and three brothers, Mark J., Jack, and William Laverick. Jack Laverick, who heads the company, was a lieutenant in the Army Air Corps until his recent discharge and served as a bombardier in the European theater. He was awarded the Distinguished Flying Cross, the Air Medal with three oak leaf clusters, and the Presidential unit citation.

Also recently released from the armed forces, Mark Laverick was a lieutenant in the Navy and served in the Aleutians with the Seabees. William Laverick and Herbert Hecker are graduated electrical engineers and served in the radio division at Fort Monmouth for the last six years, specializing in the radio and radar field.

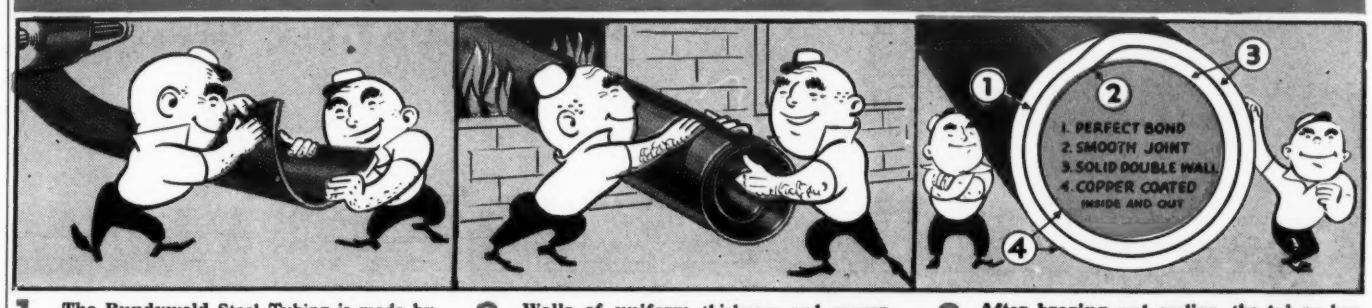
Admiral Corp. Announces Dividend Payment

CHICAGO—Board of directors of Admiral Corp. has declared a dividend of 12½ cents per share on the issued and outstanding stock of 900,000 shares.

Frigidaire's Postwar DI-7 Refrigerator Has New Convenience Features

The refrigerator in the above picture is a Frigidaire postwar product—the new deluxe 7-cu. ft. model DI-7 electric refrigerator. New features claimed for this model are a 12-way convertible interior, which makes possible a flexible shelf arrangement; a non-refrigerated storage bin at the base of the refrigerator, and a glass-topped hydrator. Cash installed price (including federal tax and warranty) is $180.75.

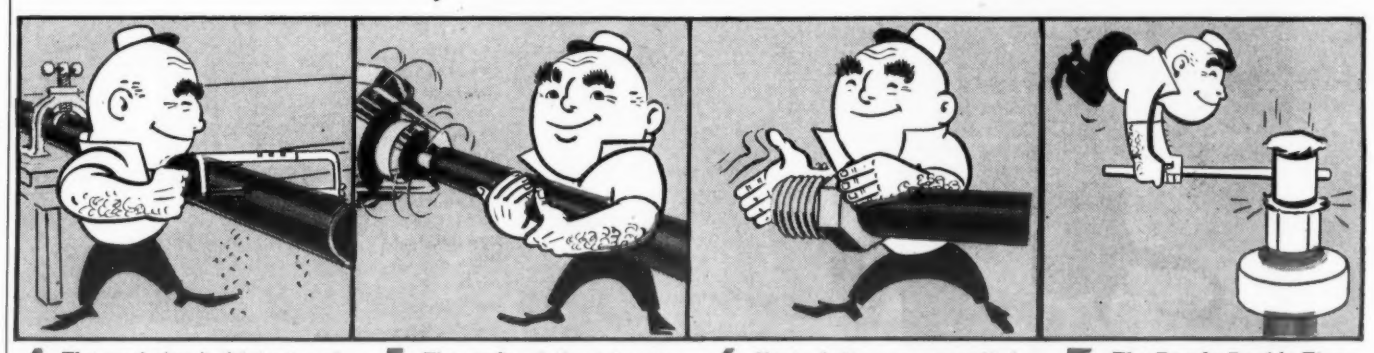
FABRICATING A TYPICAL
BUNDYWELD LIFE LINE



1 The Bundyweld Steel Tubing is made by a process entirely different from that used in the making of any other tubing. A single strip of copper-coated S.A.E. 1010 steel is continuously rolled twice around laterally into tubular form.

2 Walls of uniform thickness and concentricity are assured by the use of close tolerance cold rolled strip. This double rolled strip is next passed through a brazing furnace where the copper coating fuses and alloys with the double steel walls.

3 After brazing and cooling, the tubing has become a perfectly bonded SOLID double wall steel tube, completely copper brazed throughout 360° of wall contact, copper coated inside and out, free from scale and closely held to dimensions.

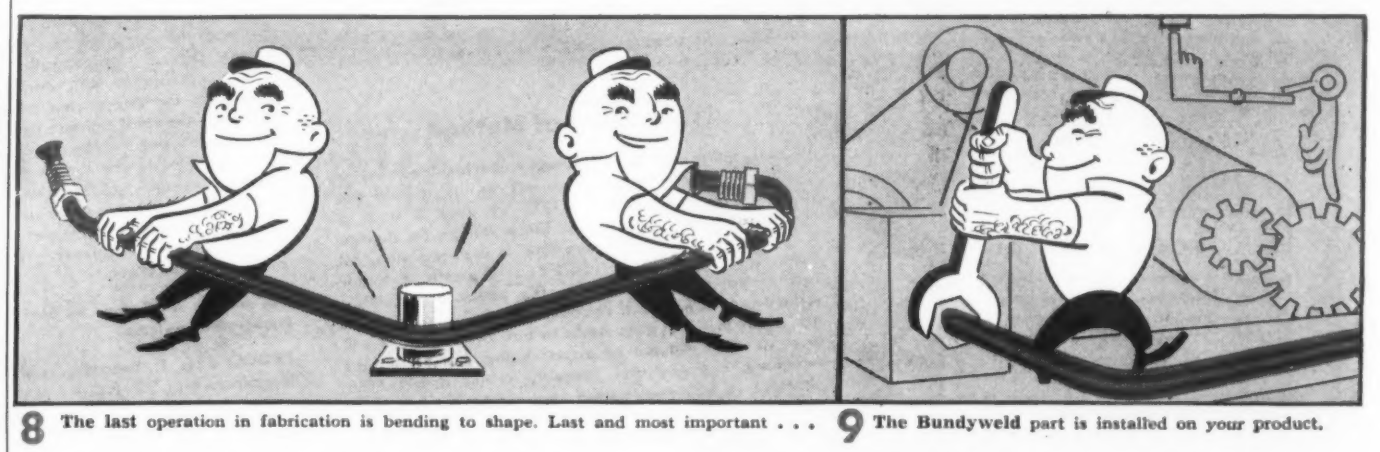


4 The next step in fabrication of a Bundyweld part is cutting to length, which is done at the Bundy plant on a circular saw, or, in the field, with any tube cutter which may be available.

5 The ends of the tube are burred with a specially designed tool with cutting edges of high speed steel which removes both inside and outside burrs in one operation.

6 Next, fittings are assembled. Any of the standard flare, compression type or soldered fittings may be used. Where flare type fittings are used, the Bundy Double Flare is recommended.

7 The Bundy Double Flare, which has been adopted as a standard by the S. A. E., safely permits frequent removal and replacement of fittings, as well as over-torqueing.



8 The last operation in fabrication is bending to shape. Last and most important . . .

9 The Bundyweld part is installed on your product.

Bundyweld Steel Tubing is furnished hard or annealed in standard diameters and gauges up to 5/8" O. D. Special sizes cold drawn as desired.

Bundyweld is also furnished in Monel. For complete information, contact our nearest representative or write Bundy Tubing Co., Detroit 13.

BUNDY TUBING

ENGINEERED TO YOUR EXPECTATIONS

BUNDY TUBING DISTRIBUTORS AND REPRESENTATIVES:

Pacific Metals Co., Ltd. 3100 19th St. San Francisco 10, Calif.
Standard Tube Sales Corp. 1 Admiral Ave. Maspeth, N.Y.C., N.Y.
Lapham-Hickey Co. 3333 W. 47th Place Chicago 32, Illinois
Rutan & Co. 112 S. 16th St. Phila. 2, Pa.
Eagle Metals Co. 3628 E. Marginal Way Seattle 4, Wash.
Alloy Metal Sales Ltd. 861 Bay St. Toronto 5, Canada

Electrimatic
AUTOMATIC CONTROL VALVES AND REGULATORS
2100 INDIANA AVENUE · CHICAGO 16, ILL.

LARKIN COILS
MECHANICAL REFRIGERATION
The Watchdog of the Nation's Food Supply
Refrigeration Products
Humi-Temp Forced Convection Units—Patented CROSS-FIN-COILS—Bare Tube Coils—Zinc Fused Steel Plate Coils—Disseminator Pans—Heat Exchangers — Evaporative Condensers — Instantaneous Water Coolers—
See Your Jobber or Write Direct
LARKIN COILS,
519 Memorial Drive, S.E., Atlanta, Ga.

L. F. WORTH

Now manages sales of the Bendix automatic dryer to be marketed in the spring.

10 Technical Papers, Several Social Events Programmed for 52nd A.S.H.V.E. Meeting

NEW YORK CITY — Studies on therapeutic uses of low temperature and physiological effects of high effective temperatures and elevated mean radiant temperatures are included in the 10 technical papers to be presented at the fifty-second annual meeting of the American Society of Heating & Ventilating Engineers, to be held Jan. 28 to 30 at Hotel Commodore here.

Technical sessions are scheduled for the morning and afternoon of Tuesday, Jan. 29, as well as the morning of Jan. 30.

Registration opens at 9 a.m. Monday, Jan. 28, in the foyer of the Commodore's west ballroom. First business session of the society will be held at 2 p.m. to hear reports of various committees and a report on the revision of the A.S.H.V.E. charter. President C.-E. . A. Winslow will preside.

Social features of this year's meeting include a welcome luncheon to be held at 12:15 p.m. Monday with R. H. Carpenter, general chairman of the committee on arrangements, as toastmaster. Harvey Wiley Corbett, New York architect, will speak on the subject, "Are We Overmechanizing Life?"

A Mardi-Gras party, consisting of dinner and carnival entertainment staged by John Murray Anderson, is planned for Monday evening at the Hotel Capital, 51st St. and 8th Ave., announces Prof. M. C. Giannini, chairman of the entertainment committee.

Main social event of the meeting will be the annual banquet in the Grand Ballroom of the Commodore on Tuesday at 7 p.m. W. H. Driscoll, past president of the society, will be toastmaster. At the banquet the past president's emblem will be presented to the retiring president, and the F. Paul Anderson medal also will be awarded.

In addition to Mr. Carpenter, the committee on arrangements includes Vice Chairman M. C. Giannini, W. E. Heibel, H. S. Johnson, C. S. Koehler, and H. J. Ryan.

Chairmen of other committees are Mr. Giannini, entertainment; Alfred Engle, banquet; W. M. Heebner, finance; C. S. Pabst, inspection; H. S. Wheller, ladies; C. F. Roth, publicity; E. J. Ritchie, sessions; and H. J. Ryan, reception. Carl H. Flink is secretary.

Program for the meeting follows:

Sunday, Jan. 27

2:00 p.m.—Council meeting.

Monday, Jan. 28

9:00 a.m.—Registration.
12:15 p.m.—Welcome luncheon (east ballroom).
2:00 p.m.—Business Session (west ballroom).
6:30 p.m.—Mardi-Gras dinner and carnival, Hotel Capital.

Tuesday, Jan. 29

9:00 a.m.—Registration.
9:30 a.m.—Technical session (west ballroom).

"A Study of Several Coal-Fired Magazine-Feed Space Heaters," by R. C. Cross and H. N. Ostborg.

"Application of High Temperature Liquid as a Heat or Energy Transfer Medium for Domestic and Industrial Uses," by O. O. Oaks.

"A Single-Equation Design Procedure for Radiant Panel Systems," by F. W. Hutchinson.

2:00 p.m.—Technical session (west ballroom).

"Low Pressure Properties of Water from -160° to 212° F.," by John A. Goff and S. Gratch.

"Therapeutic Uses of Low Temperature," by Frederick M. Allen, M.D.

"Heating and Ventilating of Transport Aircraft," by B. M. Brod.

7:00 p.m.—Annual banquet (grand ballroom).

Wednesday, Jan. 30

9:30 a.m.—Technical session (west ballroom).

Report of the committee on research.

"Effect of Branch Take-Off Design on Noise in Ventilating Duct Systems," by Oscar Imalis, F. C. Houghten, and C. M. Humphreys.

"Physiological Response of Subjects Exposed to High Effective Temperatures and Elevated Mean Radiant Temperatures," by C. M. Humphreys, Oscar Imalis, and Carl Gutberlet.

"A Psychlological and Physiological Study of the Accuracy, Variability, and Volume of Work of Young Men in Hot Spaces with Different Noise Levels," by Dr. Morris S. Viteles and Dr. Kingsley Smith.

"Shielding of Thermocouples from the Effect of Radiation," by G. V. Parmelee and R. G. Huebscher.

Following installation of new officers and society business the annual meeting will adjourn after this session.

Numerous committee meetings have been scheduled for both the Hotel Commodore and the Hotel Pennsylvania as follows:

Sunday, Jan. 27

(Hotel Commodore)

10:00 a.m.—Finance committee (Parlor D), committee on research (Parlor B), code for testing heavy duty furnaces (Parlor F).
2:00 p.m.—Council (Parlor C), Technical Advisory Committee on radiation and comfort (Parlor E).

Monday, Jan. 28

(Hotel Commodore)

9:30 a.m.—Guide publication committee (Parlor D), chapter delegates (Parlor A), T.A.C. on air cleaning (Parlor F), T.A.C. on glass (Parlor D).
4:30 p.m.—Nominating committee (Parlor A).

Monday, Jan. 28

(Hotel Roosevelt)

9:30 a.m.—T.A.C. on air distribution and air friction (Parlor O), T.A.C. on air sterilization and odor control (Parlor L), T.A.C. on weather design conditions (Parlor M.)

Wednesday, Jan. 30

(Hotel Commodore)

12:30 p.m.—Council luncheon meeting (Parlor A).

Philco Corp. to Purchase Former Atwater Kent Plant

WASHINGTON, D. C. — Philco Corp. will purchase the former Atwater Kent Plant No. 6 in Philadelphia as soon as the transaction is approved by the Surplus Property Administrator and the Attorney General, it was recently revealed by the Reconstruction Finance Corp.

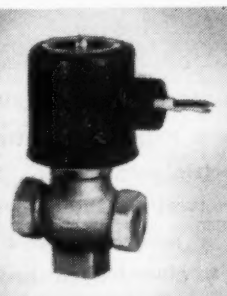
Purchased by the Defense Plant Corp. for $1,000,000 in November, 1941, the plant was leased to Bendix Aviation Corp. for the manufacture of airplane parts and other equipment. The factory has 640,000 sq. ft. of floor space.

Although the RFC confirmed rumors that Philco had been negotiating with it for the purchase, the agency did not give the price involved. No comment was forthcoming from Philco.

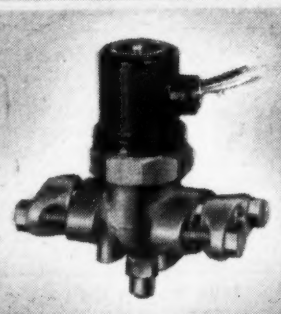
Note these Features of "DETROIT" SOLENOID VALVES

1. POWERFUL—Ample power to lift against high pressures.
2. QUIET—Design of plunger and guide tube minimizes objectionable a-c hum.
3. EASILY INSTALLED—Substantial mounting boss on valve body makes for easy, rigid installation.
4. EASILY SERVICED—Can be disassembled and cleaned without disconnecting refrigerant lines or wiring.
5. POSITIVE CLOSING—Nonmagnetic needle and seat and strong "kick off" spring assure tight closing.
6. LONG-LIVED—Valve bodies are of close-grained, non-porous cast brass. Coils are of moisture-proof construction.
7. ECONOMICAL—Draw little current. Replacement parts if required are inexpensive.

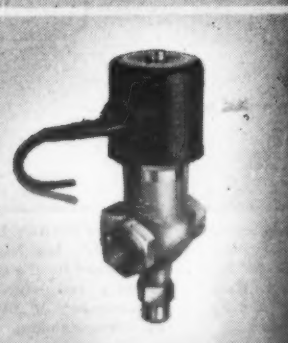
Specify "DETROIT" Solenoid Valves.



No. 683-3—This reliable valve, like all "Detroit" solenoids is designed for use with any fluid that will not attack brass. Furnished with three sizes of orifices, 1/8", 3/16" and 7/32".
Nominal capacity—liquid line
1/8" orifice 1-1/3 tons Freon 2-3/4 tons Methyl
3/16" orifice 3 tons Freon 6-1/2 tons Methyl
7/32" orifice 3-3/4 tons Freon 8-3/4 tons Methyl
3/8" female N.P.T. connections.



No. 686—The No. 686 is a heavy duty, large capacity pilot operated valve which requires a pressure drop of 1-3/4 psi to operate the piston when used with refrigerants, 5 psi on water. It is made with 2 sizes of orifices, 1/2" and 5/8". Available threaded, or flanged for various size tail pipes.
Nominal capacity—liquid line
1/2" orifice 11 tons Freon 23 tons Methyl
5/8" orifice 17 tons Freon 34 tons Methyl



No. 681—The No. 681 is of the pilot operated type and requires a minimum pressure drop of 1 psi to operate the piston.
Nominal capacity—liquid line
5/8" orifice 7-1/2 tons Freon 17 tons Methyl
1/2" female N.P.T. connections.

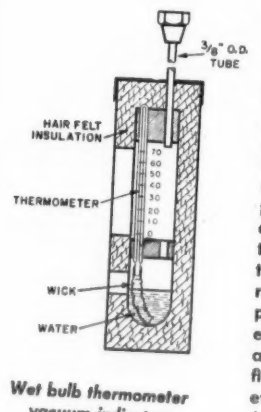
FOUR WIRE COIL

One of the features of "Detroit" solenoids preferred by jobbers and service men is the dual 115-230 volt 4 lead coil. This coil can be used on either 115 volt 60 cycle or 230 volt 60 cycle current by connecting the 4 leads in the right sequence. Correct wiring diagram is shown right on the coil-housing—a great time saver.

DOUBLE EVACUATION METHOD OF DRYING

No. 10 of a Series

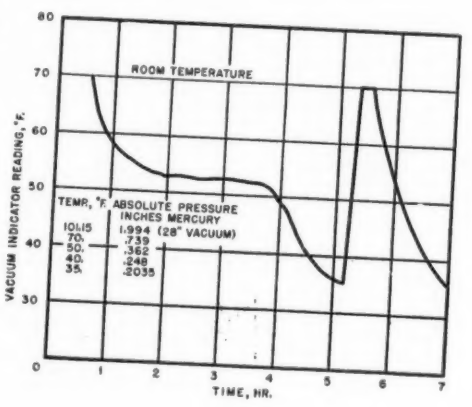
When drying a refrigeration system by this method, a vacuum indicator, consisting of an insulated test tube containing a wet bulb thermometer with its wick immersed in distilled water, is connected to the high efficiency vacuum pump suction line. The thermometer will register the boiling temperature of the water in the system.



Wet bulb thermometer vacuum indicator.

Water, like the well-known refrigerants, has a characteristic curve defining an exact pressure-temperature relationship. With a very low absolute pressure (high vacuum), water will boil at 35° F and by the use of a high vacuum with all parts of the system at or near room temperature (70° F) a temperature difference between room and suction temperatures can be established which will allow sufficient heat to flow into the system to evaporate the water. As heat will flow in at a slow rate and since there may be large quantities of water to evaporate, the time necessary for complete dehydration is indefinite.

Results can be rather accurately determined by indirectly measuring the absolute pressure in the system by means of the "Vacuum Indicator".



A typical dehydration with vacuum indicator readings plotted against time.

Explanation of Method

When the dehydration operation is started the reading of the wet bulb thermometer will be practically the same as room temperature (70° F) since it is in a nearly saturated atmosphere. There will be no change in this reading until the pressure is reduced to .739 inches Mercury absolute (the vapor pressure of water corresponding to 70° F). As the pressure is further reduced, the indicator reading will fall rapidly until the water in the system starts to boil after which it will level out (the volume of vapor being formed equals the pump capacity and prevents further drop). After all moisture has evaporated and most of it has been pumped out of the system, the indicator will again fall rapidly as the pump removes air and water vapor. Evacuation should continue until the vacuum indicator shows a temperature of 35° F at which time the absolute pressure in the system will be .2035 inches Mercury.

Assuming this pressure to be due entirely to the water vapor remaining in the system, the residual moisture which this vapor represents can be calculated. Its density at .2035 inches Mercury absolute pressure is 2947 cu ft per lb, which is equivalent to 2.37 grains per cu ft If the system is opened at the point furthest from the pump and air is admitted while pump is running, a portion of the vapor will be swept out and the remainder greatly diluted. Approximately 5.3 grains of moisture will be carried in with each cu ft of average air. Neglecting the sweep and considering only the effect of dilution the total moisture content is now 2.37 + 5.3 or 7.87 grains per cu ft at atmospheric pressure. Now, by re-evacuating the system to 35° F or .2035 inches absolute pressure which is a compression ratio of 1/147, the moisture content is reduced to 7.87 divided by 147, or .054 grains of moisture per cu ft. In a typical system this will result in approximately 1 part moisture per million parts of Freon.

This method is effective on both high and extremely low temperature systems.

PROCEDURE: 1. Evacuate until vacuum indicator shows temperature of 35° F.

2. Open system at point furthest from vacuum pump with pump running and allow pressure to rise to atmosphere.

3. Re-evacuate until vacuum indicator again shows temperature of 35° F.

Reprints of these articles, size 8½ x 11" and punched to fit standard 3-ring binder, are available on request. Write for your copies.

DETROIT LUBRICATOR COMPANY Division of American Radiator & Standard Sanitary Corporation

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General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

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'Scientific' Hiring Procedures for Distributors And Dealers Is Goal of N.E.W.A. Program

NEW YORK CITY—A new high in personnel efficiency in all job categories throughout the entire field of electrical distribution is the aim of a scientific hiring program to be conducted through the National Electrical Wholesalers Association, states Charles G. Pyle, managing director of the Association.

Complete hiring procedures, including aptitude testing, will soon be established for both N.E.W.A. member companies and their dealers with a view to helping them obtain the right people for the right jobs and, in some instances, to reassign present employes in order to take greater advantage of their abilities and aptitudes. It is pointed out that once scientific personnel selection has been achieved, and is a continuing procedure, substantial savings in turnover and in training costs are automatically effected.

The national plan was developed under the direction of the N.E.W.A. Publicity, Sales Promotion, and Sales Training Committee. The Association has now retained a qualified national organization to prepare the program material. Grading of the special selector tests can be handled within 24 hours because of the location of that company's offices at New York, Chicago, and Los Angeles.

The national program, Mr. Pyle states, will comprise two complete hiring procedures—one for electrical wholesalers, the other for retailers. For members of N.E.W.A. the hiring procedure will consist of the following:

HIRING FOR WHOLESALERS

1. A printed manual which will cover completely all of the various steps in scientific selection. It will deal with typical job description, typical man specification, recruiting methods, use of the preliminary interview, interpretation of personal histories, reference checking, administering and interpreting tests, and how to upgrade and develop the present sales organization.

2. Fifty preliminary interview forms—for the specific purpose of screening out all applicants who do not meet the minimum qualifications. They are weighted, and instructions for their use will be in the manual.

3. Thirty-five personal history inventories.

4. Twenty diagnostic interviews—for use on the second interview. Here, too, the manual will instruct on scoring and interpretation of results.

5. Five comprehensive batteries, each containing a registration sheet, test on mental ability, test on vocabulary, on sales aptitude, personality, and social intelligence.

RETAILERS' PROCEDURE

Similarly the complete hiring procedure package for retailers will contain a manual, 25 preliminary interview forms, 20 personal history inventories, 10 diagnostic interviews, and two special selector retail batteries. The last named will include a registration sheet, a 12-minute mental ability test, personality test, and a test on sales apitude.

Robert C. Hill, director of the appliance division of N.E.W.A. assisted the committee in the development of the general plan for a hiring program and supervised the organization of materials and procedures.

George F. Kindley, Edgar Morris Sales Co., is chaiman of the N.E.W.A. Publicity, Sales Promotion, and Sales Training Committee, and L. P. Kefgen, Northern Supply Co., is chairman of a Sub-Committee appointed to deal specifically with the hiring program activity. Members of Mr. Kefgen's Sub-Committee are:

K. B. Hopkins, Graybar Electric Co., Inc.; P. D. Karsten, The Plymouth Electric Co.; C. E. Mason, Novelty Electric Co.; H. D. Roseth, Co-Op Electric Supply Co.; and H. O. Smith, The Hardware Supply Co.

In addition to those already named the full committee, headed by Mr. Kindley, includes:

A. F. Gould, Central Electric Supply Co.; S. Roskin, Roskin Distributors, Inc.; W. G. Steltz, Suppiee-Biddle Co.; and Adolph Ullman, Northeastern Distributors, Inc.

Thermal Industries In Detroit Plans To Produce 'Package' Air Conditioners and Home Freezers

DETROIT — Packaged air conditioners and home freezers soon will be placed on the market by Thermal Industries, Inc., here, according to Emanuel Feinberg, president.

Preparatory to starting production of the conditioners and freezers, the corporation is now in the process of being reorganized to increase its capitalization, Mr. Feinberg said. American Thermal Industries was formed in December of 1944 for the purpose of specializing in the manufacture of packaged air conditioners, and later decided to enter the freezer field also.

PLAN 7 CONDITIONERS

Seven models of the air conditioning units will be manufactured. For the present, the firm is concentrating on one size of farm and home freezer. Models of these products, to be produced in Detroit, are now undergoing tests.

The concern expected to be in production on the air conditioners in January, with some units completed by the end of the month. It was believed that a limited quantity would be available in February.

Capacities of the air conditioners will range from 3 to 25 tons, Mr. Feinberg stated. The current production schedule calls for about 500 3, 5, 7½, 10, and 15-ton units, with the 20 and 25-ton models to be marketed later on.

It was explained that the conditioners will be equipped with water-cooled condensers. Built-in evaporative condensers are to be optional equipment for the larger sizes.

Mr. Feinberg said installation of optional steam or hot-water equipment will permit year-around air conditioning.

No trade name has as yet been selected for the line.

That the air conditioning systems are not new but have been tested in the field was emphasized by Mr. Feinberg. He pointed out that units similar to those American Thermal will manufacture had been designed, jobbed out, and put in operation during the past several years.

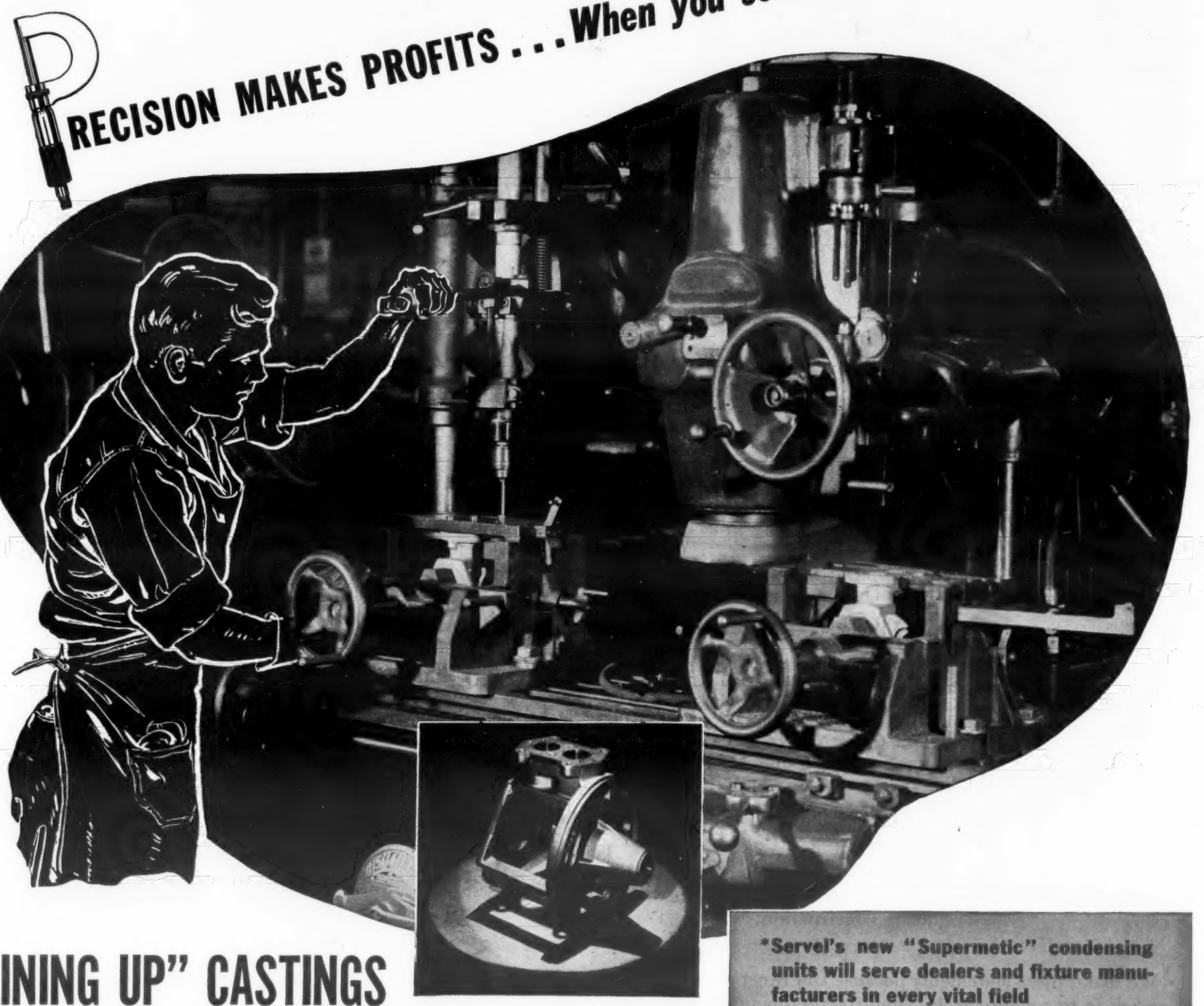
American Thermal plans to manufacture approximately 5,000 of its Model HF-61 home freezers as a starter. To be marketed under the name "Freezaway," the freezer has a capacity of 6 cu. ft. and a condensing unit of ⅛ hp.

600 FREEZERS MONTHLY

Six hundred units a month is the production goal set on the freezers, which will retail at a ceiling price of $280. A larger model is planned for future manufacture.

A distribution set-up is now being worked out by the firm.

In addition to Mr. Feinberg, other officers of the corporation are Samuel Oschin, vice president; Morris Weinberg, treasurer; and Henry Ament, secretary and supervisor of engineering and production. Mr. Feinberg, former general manager of Thermal-air Engineering Co., of Detroit, has been a manufacturers' agent and an application and consulting engineer.



"LINING UP" CASTINGS PROTECTS YOUR PROFITS

Illustrated is an ingenious milling and drilling operation which plays a large part in the profit-building durability of the Servel condensing units you sell. It lines up piston bores, shaft lines, heads, and other parts so that machining operations can be held within accurate clearance limits. Here's how it's done:

The rough castings from the foundry are fed through the milling machine. A rotary cutter accurately surfaces the top to a flat "reference" surface. Then a high speed drill sinks two "locating holes" in the correct location in the reference surface.

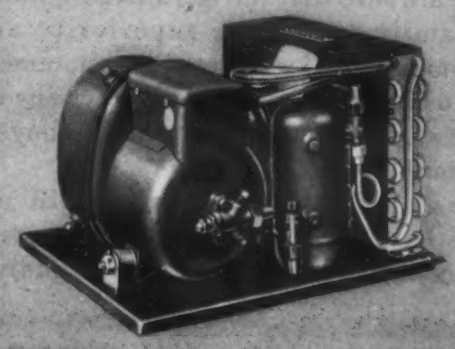
In all subsequent machining operations on this casting, the reference surface and the two holes are clamped over pins in flat steel plates. The casting is thus held in perfect alignment, and can be accurately machined to extremely close tolerances.

Not all the hundreds of precise and ingenious operations involved in making Servel condensing units are as simple and obvious as this one may seem. But all help to put profits in your pocket . . . because all contribute to the longer unit life, the lower service cost, and the greater consumer satisfaction which Servel units enjoy!

One of the new Servel Supermetic units will fit your condensing unit requirements exactly. For a description of it, send for our new folder, "Servel Supermetic." Address Servel, Inc., Div. RN, Evansville 20, Indiana.

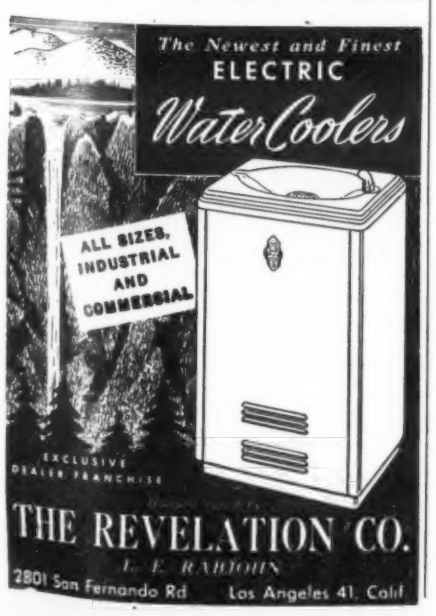
*Servel's new "Supermetic" condensing units will serve dealers and fixture manufacturers in every vital field

1. STORE FIXTURES
2. MILK COOLERS
3. HOME LOCKERS
4. BEVERAGE COOLERS
5. VENDING MACHINES
6. ROOM COOLERS
7. FARM FREEZERS
8. WATER COOLERS
9. INDUSTRIAL COOLING
10. VEHICLE REFRIGERATION



Servel, Inc.
Electric Refrigeration Division, Evansville 20, Indiana

This is one in a series of advertisements featuring the scores of new machine tools and processes now being used to produce Servel Supermetics. Reprints are available to dealers individually or in sets as series progresses.



They'll Do It Every Time . . . . By Jimmy Hatlo

SALESMAN JONES OF JONES & JONES CARRIES A CARD YOU CAN READ IN A FLASH -
Purchasing Agent
BUT YES. YOU MAY GO RIGHT IN, MR. JONES.
P. JONES JONES & JONES
RECEPTIONIST
COPR. 1945, KING FEATURES SYNDICATE, Inc., WORLD RIGHTS RESERVED
11-28
BUT THIS LITTLE TWERP - WITH A NAME LIKE A BURP GARGLES IT UNDER HIS MUSTACHE —
WHO ?
FRANNISTAN KORXKIKOFF OF REMCIWECZ, GILHOOLEY & HUTSUT-NUTSH AN' BOLTSH.
RECEPTIONIST
Thanx To DOROTHY BECK 2244 So. 22ND ST. PHILADELPHIA -
JIMMY HATLO

☆ *Buy VICTORY Bonds* ☆

Thermopane

REGISTERED U.S. PATENT OFFICE

The acceptance of *Thermopane*—Libbey·Owens·Ford's transparent insulating unit—has been tremendous! It is timely to emphasize the following:

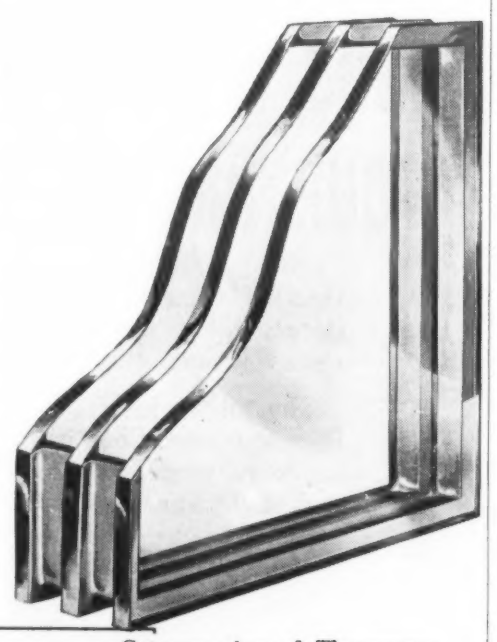
1. *Thermopane* is a registered trade mark of the Libbey·Owens·Ford Glass Company;
2. Only Libbey·Owens·Ford makes *Thermopane*;
3. Only Libbey·Owens·Ford can call a transparent insulating unit *Thermopane*;
4. Only *Thermopane* has the Bondermetic Seal which bonds the panes of glass into one unit to guard against entrance of dirt and moisture into the dry air space;
5. The name "*Thermopane*" can and should be used when referring to the L·O·F product;
6. The word "*Thermopane*" should never be used when referring to any other brand of multiple-glazing construction.

We make these statements because the function of a trade mark is to unequivocally identify the manufacturer of a product . . . and to eliminate the possibility of confusion in the mind of the public concerning the producer of a specified product . . . and to assure that the customer gets what he orders.

We are sure that refrigeration engineers and others who are familiar with the superiority and advantages of *Thermopane* will welcome these statements . . . will refrain from using our trade mark in referring to any construction or product not made by the Libbey·Owens·Ford Glass Company.

We believe that our readers will understand L·O·F's pride in *Thermopane* and our sincere desire to have *Thermopane* continue to enjoy its individuality.

©1945



Cut-away view of *Thermopane*

LIBBEY·OWENS·FORD
a Great Name in GLASS

LIBBEY·OWENS·FORD GLASS COMPANY...TOLEDO 3, OHIO

Trade Mark registered U. S. Patent Office: Est. 1926

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AIR CONDITIONING AND REFRIGERATION News

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F. M. COCKRELL, *Founder*

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VOLUME 47, NO. 3, SERIAL NO. 879, JANUARY 21, 1946

Dealers Aren't Very Happy About Things Today

FOR the prize understatement of 1946, we nominate the above headline. Not in the writer's memory—no, not even in the dark days of 1933 and 1934—has the morale of appliance dealers been at a lower ebb than it seems to be now.

Frustrated people—that's what they are. Apparently it isn't nearly so discouraging to have insufficient orders as it is to have too many orders and no merchandise.

During the last few weeks we have attended several dealer meetings in different localities. Wherever we've gone the attitude has been the same: an almost hopeless sort of despair.

Many dealers are quarrelsome. They harbor the jealous suspicion that their distributors are holding out on them, are playing favorites. Others insist on believing that the manufacturers are deliberately stockpiling—waiting for a break from the OPA. Many more blame strikes and low labor output.

These latter are 100% right. The former two suspicions are 99% wrong.

There's one aspect of the picture which has misled many dealers, we believe. That is "multiple shopping." A prospect who needs a refrigerator, or a range, or water heater, may place orders with two dozen dealers. Now, that prospect doesn't want two dozen refrigerators. She just wants the first one she can get.

Some few distributors who have taken the trouble to check names and addresses of "firm orders" placed have found considerable repetition of the same names *among their own dealers.* And they conjecture that these repeaters have also been around to see dealers who handle competitive makes.

Like political machines in some big cities, these "voters" are simply stuffing the ballot boxes.

All this pyramids up into dizzy pictures of demand.

Of the fact that the demand is there, and that it is larger than anything known heretofore, there is little question. But is it anything like as big as many dealers and distributors believe it is?

Pressures on field salesmen, and on distributors, are in geometrical proportion to those visited on dealers. And if you're a factory sales manager—well, you're on a very hot seat indeed.

No home appliance merchandising man—anywhere up or down the line—can be comfortable nowadays, or in a happy frame of mind.

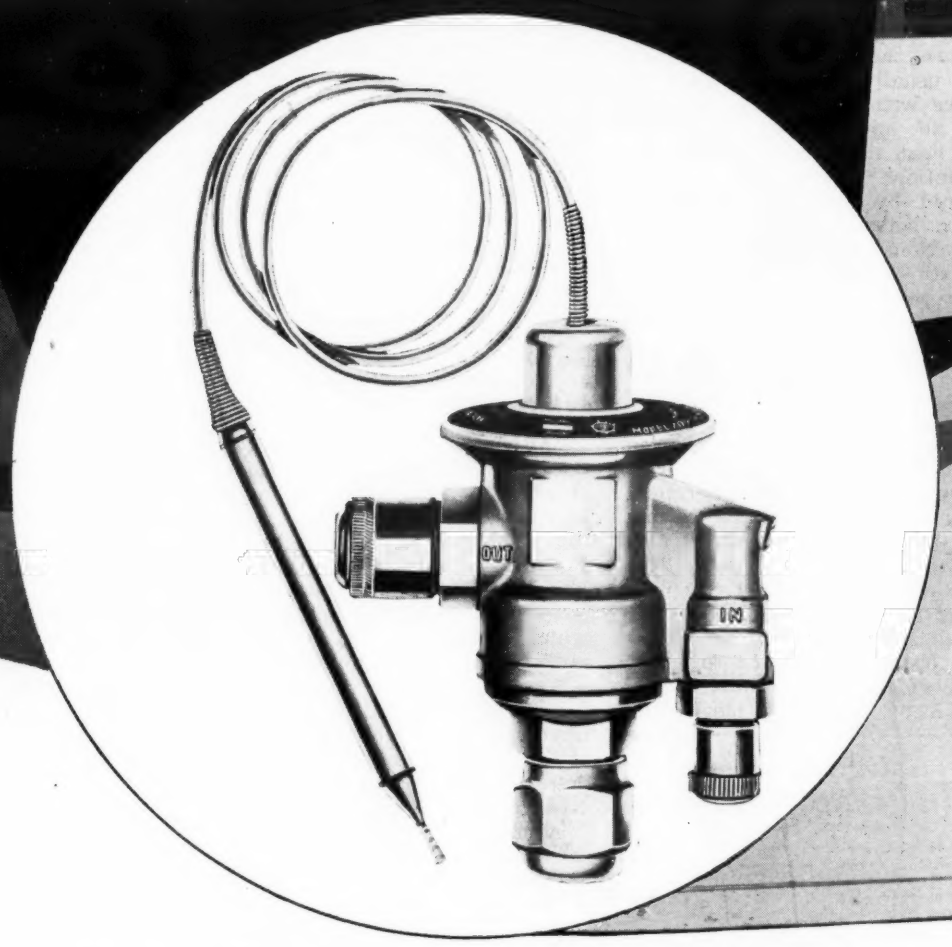
All we can do is counsel patience. Every man in the business has frayed nerves today—but this is no time for short tempers or recriminations or accusations.

Everybody is in the same boat. Manufacturers are eager to sell all the goods they can, and so are distributors and dealers. To each the deficiency in supply is a nightmare.

Some day people will feel like working again. And when that happy day comes, we'll all be back in business.

SATISFACTION FOR CUSTOMERS AND SERVICEMEN—WITH A-P VALVES...

Herbert Frame
Service Manager
Public Service Co.
Baltimore, Maryland



Herbert Frame, Service Manager of the Public Service Co., of Baltimore, shown above, is checking the temperature of an ice-cream cabinet on test. A standard "A-P" Thermostatic Expansion Valve Model 207 is used on this job as standard equipment.

Writes Mr. Frame: "A-P Valves for high and low temperature work have been used by our company since 1936. Customers' satisfaction as well as servicemen's satisfaction has been accomplished by the use of A.P. Valves during this period."

There is more profit for servicemen and customers alike — with standard A-P Thermostatic Expansion Valves that can be used on low temperature, commercial temperature, and air conditioning work without adjustment.

You have less stock to carry, and your customers get better service—the kind that keeps them your customers year in and year out.

Bulletins covering all "A-P" Refrigeration Controls will be sent you upon request.

AUTOMATIC PRODUCTS COMPANY
2450 N. 32nd Street, Milwaukee 10, Wis.
Export Dept. 13 E. 40th St., New York 16, N. Y.

DEPENDABLE *Refrigerant Valves*

Stocked and Sold by Good Refrigeration Jobbers Everywhere • Recommended and Installed by Leading Refrigeration Service Engineers

Thermal Conductivity of Insulation Reduced as Temperature Goes Down

15% to 40% Drop Over 150° Range Found in Lab Tests at Minnesota U.

NEW YORK CITY — Preliminary laboratory tests at mean temperatures ranging as low as -60° F. indicate that the thermal conductivity of common insulating materials is reduced as the temperature goes down.

These findings, presented at the 41st annual meeting of the American Society of Refrigerating Engineers here, resulted from tests conducted by the graduate school of the University of Minnesota at its engineering experiment station.

The paper entitled "Thermal Conductivity of Insulating Materials at Low Mean Temperatures" was prepared by Frank B. Rowley, head of Minnesota U.'s department of mechanical engineering; Richard C. Jordan, assistant head of the department; and Robert M. Lander, junior scientist of the experiment station. Dr. Jordan presented the paper at the meeting.

8 Types Tested

Tested over a range of mean temperatures from 90° F. to -60° F. were corkboard, wood fiber board, mineral wool board, cellular glass block, rock wool, glass wool, redwood bark, and silica aerogel.

Results are shown in tabular form in Table 1, which summarizes the thermal conductivity in B.t.u./sq. ft./°F./hr. for the materials tested, and Table 2, which lists the percentage changes in thermal conductivity in the range from 90° to -60° F.

"An analysis of these results indicates a marked variation in thermal conductivity with changes in mean temperatures," the authors state. "The maximum change was found with glass wool in which the conductivity was 0.303 at 90° F. and 0.183 at -60° F. mean temperature.

"The smallest change was found in the case of silica aerogel in which the conductivity was 0.169 at 90° F. and 0.133 at -60° F. mean temperature.

"In interpreting these results, it should be noted that all tests were made under laboratory conditions with extreme care taken to prevent any condensation of moisture within the test materials," caution the authors. "In field applications such conditions are often difficult to duplicate, and any moisture condensation upon or within these insulating materials may materially alter the results. . . .

"An analysis of these values (see Table 2) indicates that for those materials tested this drop of 150° F. in mean temperature is accompanied by a corresponding thermal conductivity drop of between 15% and 40%.

Loosely Packed Material Has Greatest Drop

"In the case of the more loosely packed material, this percentage drop is the greatest," the authors point out. "Thus, for rock wool, it is 35.2%, for glass wool 39.6%, and for redwood bark 29.8%.

"In general, the lowest percentage drops are found with the highest density materials. Thus, in the case of corkboard (12.2 lb. per cu. ft. density) this percentage drop is 14.6%, for corkboard (8.0 lb. per cu. ft. density) 16.3%, and for wood fiber board 18.3%. These general observations concerning conductivity, mean temperature, and density are only approximate, however, as density is only one of the controlling factors," say the authors.

"It is evident . . . that the greatest percentage drops in conductivity are to be found . . . for those materials across which there is the greatest chance for transfer of heat by radiation. Thus, with the comparatively loosely packed fibrous materials it is probable that more radiant heat transfer occurs than in a closely packed fibrous material or aggregate.

"It would also be expected that the least amount of radiant heat transfer would occur in a material bound into a rigid board. There are, of course, many complicating factors, such as fiber or grain size, arrangement of air cells, and type of binding material. The best direct comparison may be found in the cases of three corkboard samples of three different densities [see tables]. Here the sample density varies inversely with the percentage drop in conductivity.

Radiation Factor

"Although the amount of heat transferred across a rigid or flexible insulating material is generally determined by application of the laws of heat conduction and a predetermined conductivity coefficient, actually only a portion of the heat transfer is entirely by conduction," the authors say.

"Because the construction of the material usually involves air cells or interstices within the pack, there is usually an appreciable amount of internal heat transfer by convection and radiation. The amount of heat transferred by radiation across an air space between parallel surfaces is proportional to the difference in the fourth power of the surface temperatures.

"Thus, radiation may be an important factor in the transmission of heat through a porous material, and this rate of radiant heat transfer will be much greater at high mean temperatures than it will at low, even though the temperature difference is the same in both cases. Therefore, those insulating materials having the greatest amount of heat transferred by radiation will show the greatest change in conductivity with a change in mean temperature.

"Of all the materials tested the greatest change was found for glass wool, in which the conductivity was reduced 39.6% when the mean temperature dropped from 90° F. to -60° F. If an insulation were conceived in which all heat is transferred by radiation and none by convection and conduction, such, for example, as one consisting of parallel infinite planes with all intervening gases evacuated, then the heat transfer between these surfaces can be calculated by the Stefan-Boltzmann Law of Radiation.

"With such a construction a maximum drop in conductivity would be expected, and, by calculation, the percentage reduction in heat transfer coefficient is 62% when passing from a 90° F. mean temperature to a -60° F. mean temperature," estimate the authors.

In determining these thermal conductivities the test apparatus consisted of a standard 12-in. guarded hot plate with an 8-in. square test section and a 2-in. guard ring.

The cold plates were maintained at temperatures ranging from 75° F. to -75° F. by means of a single stage, air-cooled compressor, which had been originally designed for "Freon-12" but was converted for use with "Freon-22."

Winter Operation

"Although it was found that operation was satisfactory with condenser entering air temperatures ranging as high as 85° F., during operation in the winter months advantage was taken of outside air temperatures as low as 0° F. by installing the entire condensing unit in a small chamber which could be opened to the outside air," the authors explain.

Heating elements of the hot plate were supplied with energy by a direct current motor-generator set equipped with an electronic type voltage regulator permitting regulation to 0.1% variations.

Around the hot plate apparatus an insulated and vapor sealed enclosure was constructed, and this space was cooled by means of finned-type gravity circulating evaporator and a ½-hp. methyl chloride condensing unit.

Additional System Had 3 Purposes

"This additional refrigerating system," say the authors, "served three purposes: first, it reduced the heat gain to the low temperature cooling medium and thus enabled maintenance of lower temperatures in the cold plates; second, it aided in preventing condensation of moisture on the cold plates and in the insulating material itself by partially dehumidifying the surrounding air; and third, it prevented extensive heat gain through the lagging to the guard ring area of the hot plate.

"This last factor is of particular importance when testing insulating materials of a low conductance and at a low mean temperature, as under these conditions the heat gained from the surrounding air to the guard ring area may be greater than the actual heat requirements of the guard ring itself unless the surrounding air is maintained at a comparatively low temperature."

Table 1—Summary of Thermal Conductivities Determined at Various Mean Temperatures

Material	Density, Lb. Per Cu. Ft.	Thickness Test Specimen, In.	Thermal Conductivity, B.t.u. in. / sq. ft. °F. hr. — Mean Temperature °F. -60	-30	0	30	60	90
Corkboard	12.2	1	0.264	0.273	0.282	0.292	0.300	0.309
Corkboard	8.0	1	0.231	0.240	0.249	0.258	0.267	0.276
Corkboard	6.5	1	0.222	0.233	0.244	0.255	0.266	0.277
Mineral wool board	15.7	1	0.253	0.267	0.280	0.294	0.308	0.322
Wood fiber board	15.5	¾	0.285	0.297	0.310	0.323	0.335	0.348
Cellular glass block	10.3	1	0.337	0.353	0.371	0.387	0.404	0.422
Silica aerogel	7.6	1	0.133	0.138	0.145	0.152	0.160	0.169
Redwood bark	4.0	1	0.198	0.213	0.229	0.247	0.263	0.282
Rock wool	3.5	1	0.186	0.198	0.216	0.238	0.261	0.287
Glass wool	1.65	1	0.183	0.203	0.225	0.247	0.272	0.303

Table 2—Percentage Change in Thermal Conductivity Upon Lowering Mean Temperature of Test 150° F.

Material	Percentage Drop in Conductivity
Corkboard (12.2 lb. per cu. ft. density)	14.6%
Corkboard (8.0 lb. per cu. ft. density)	16.3
Corkboard (6.5 lb. per cu. ft. density)	19.8
Wood fiber board	18.3
Cellular glass block	20.1
Silica aerogel	21.3
Mineral wool board	21.4
Redwood bark	29.8
Rock wool	35.2
Glass wool	39.6

McLaughlin Introduces 9-Ft. Sectional Home Freezing Cabinet

MANKATO, Minn. — McLaughlin's here recently introduced their sectionally built freezing cabinet and claimed the following features: 3-inch fully insulated cover, full reinforced copper construction, "vaportight" offset joints, and 8-inch insulation in floors.

Capacity of the 9-cu. ft. unit is 400 pounds, although storage records of 500 pounds of meat have been reported. Two men can deliver and install a 9-cu. ft. unit in two and one-half hours, according to J. McLaughlin, president of the firm.

Fittings, Accessories Listed In New Kerotest Catalog

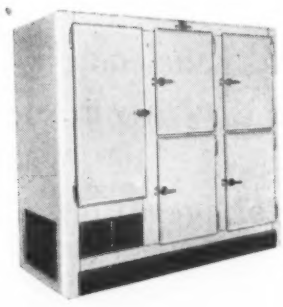
PITTSBURGH — A complete line of refrigeration and air conditioning valves, fittings, and accessories is described and illustrated in a new 16-page catalog issued by Kerotest Mfg. Co.

All types of valves and fittings are illustrated with many interior views and line drawings showing the inner sections and working parts, in full detail.

Specifications are given with each valve, fitting, and accessory, together with list prices and catalog numbers.

we'd give the world

to be able to meet all of the overwhelming demand for Koch Refrigerators.
We expect to increase Koch production steadily during 1946.



KOCH refrigerators

ESTABLISHED 1883 NORTH KANSAS CITY, MISSOURI

LITTLE DROPS OF WATER
made harmless with
ANSUL
ICE-X
TRADE MARK REG. U.S. PAT. OFF.

ICE-X quickly cures emergency freeze ups when ice forms at the expansion valve or capillary tube. Harmless to use. Great for Freon, Carrene, or Methyl Chloride systems ...The dependable liquid anti-freeze.

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EXCLUSIVE NATIONAL DISTRIBUTOR
THE HARRY ALTER CO. 1728 S. MICHIGAN AVE. CHICAGO 16, ILLINOIS
JOBBERS: WRITE FOR SPECIAL PROPOSITION!

Inside Dope

By George F. Taubeneck

How It Works

The fire control system predicts where the target will be by the time the projectile will reach it—and, by remote control—positions the guns accordingly.

In tracking the target, either manually or automatically, electrical signals giving range, course, and speed of target are transmitted to the computer system below decks.

Here the signals are combined with others giving, among other things, the ship's course, wind velocity, and shell trajectory. The resulting electrical signal from the computer then controls the motors which position the guns.

Gyroscopes stabilize or hold steady the line of sight—enabling the operator, called the "tracker," to remain constantly on the target regardless of roll or pitch of the ship.

Norge also designed a "slew" sight which enables the control officer to search out and spot targets other than that being followed by the tracker, and then permits him to shift the director to another target.

What They Ran Up Against

Because of the extreme accuracy required for distant targets, one of the difficult problems to be solved by the firm's engineers was that of producing free-running gears which would operate without "back-lash," or momentary loss of solid tooth contact when gears are reversed. Gears, therefore, had to be located exactly, and held to almost microscopic tolerances.

Incidental to this endeavor was the redesign of an already precise standard gear-shaping machine so that gears could be produced to the exactness required.

Then there was the problem of preventing sea water penetration. Some seal had to be provided. Because sea water reacts with grease, this lubricant could not be used to seal the stationary shell and rotating basket. Thus, it was necessary to develop what engineers call a "labyrinth" seal.

In evolving this seal, Norge engineers designed ridges of metal around the circumference of the director, thus forming barriers against water.

In overcoming a multitude of other complicated problems, Norge engineers had to keep in mind constantly the thought that if this director were to be used effectively aboard ship, it would have to be built within very confining weight and space limitations.

What's more, it had to be strong enough to operate smoothly in heavy seas, under terrific vibrational strain occasioned by the concussion of heavy gun blasts, and in a temperature range from minus 20 to plus 140° F.

At the same time, it had to contain all the necessary components, motors, and other complicated equipment and still leave enough room in its power-driven rotating center structure for two men—the pointer and the control officer.

Behind Locked Doors

The greatest secrecy was maintained throughout the entire period of its development. Only a very few who were closely associated with the project knew the real nature of the device.

To allay the curious, this project was referred to by the fictitious title of the "N-90 Turret."

As a result of the successful tests which were later carried out with early models of this director, the Navy Department placed a pilot production contract with Norge.

Additional production contracts were also placed by the Bureau of Ordnance at the U. S. Naval Gun Factory, Washington, D. C.

All Norge drawings have been accepted as official drawings of record. Fabrication at the U. S. Naval Gun Factory, Washington, is in accordance with these drawings.

Code of Ethics of the Toledo Appliance Dealers

Week-end before last the writer talked with a most interesting group: the newly formed Toledo Appliance Dealers Association. More than 150 turned out for an evening meeting. And they adopted the following "Code of Ethics," which might well be studied by dealers everywhere:

I. The members of Toledo Appliance Dealers' Association subscribe to the following rules of ethical conduct:

Sec. 1. Adherence to fair competitive sales practices to insure fair and legitimate profits, thus permitting the dealer to fulfill his additional responsibilities to the consumer after the sale.

Sec. 2. To refrain from offering pots and pans, dishes, alarm clocks, spiffs, or any other something-for-nothing premium, including excessive trade-in allowances. Practices of this kind are not conducive to a profitable postwar era during which it is predicted by some manufacturers and the press that profits and discounts to distributors and dealers may be lowered. Exceptions are, of course, specific factory authorized promotions.

Sec. 3. The public should not be made to pay more for any appliance than the manufacturer's established retail price. Be the name Jones or Smith, the retail buyer should not be charged more or less than his neighbor, irrespective of the product name.

Sec. 4. The public is entitled to full protection in the carrying out of the manufacturer's warranty terms by dealer.

II. Interference With Contract. The wilful interference by any person, firm, corporation, or association engaged in Electric Appliance retailing, by any means or device whatever, with any existing contract or order between a seller and purchaser of any product handled by the industry, or the performance of any contractual duty or service connected therewith, such interference being for the purpose or with the effect of dissipating, destroying, or appropriating in whole or part the business of another engaged in such industry, is unfair trade pratice. In other words, no dealer or salesman shall attempt to break down a sale or secure a contract from a customer who has definitely placed an order for an appliance with another dealer.

III. Misrepresentation: The sale or offering for sale of any product of the industry with intent to deceive customers or prospective customers as to the quality, quantity, substance, or size of such product is unfair trade practice.

IV. Defamation of Character: The defamation of a competitor by words or acts which call in question his business integrity, his ability to perform his contracts, his credit standing, or misrepresentation of the grade, quality or reliability of his goods is condemned as unfair trade practice.

V. Soliciting Employes: The solicitation or acceptance of the services of salesmen of other members of the industry without notice to the employer involved is an unfair trade practice. In other words, no dealer shall accept an order from a salesman employed by another dealer and if offered an order, such dealer shall report it to the salesman's employer.

VI. Checking of Customer Reports: Each dealer, upon receipt of information or claims by a prospective customer of any violation of the principles set forth in this stabilization plan on the part of a competing dealer, shall personally contact such dealer and ascertain the truth or untruth of statements made by the prospective customer. The purpose of this ruling is to reduce customer misrepresentation.

VII. Standards of Sound Merchandising: List prices as established by Distributors shall be the basis of all quotations and each appliance on the sales floor shall be tagged with list prices.

VIII. A signed order shall constitute a sale. A verbal order is not a sale until the contract is signed.

IX. No dealer shall permit a salesman to share his commissions with customer or make a down payment or portion thereof for a customer.

X. A member dealer shall not supply another dealer with appliances unless both dealers regularly stock and sell the same line.

XI. Trade-in allowances shall not represent more than the fair value of the article. The amount of such allowances will be suggested by the association for the guidance of its members.

XII. When used merchandise is sold, it should be clearly stated on the tag and on the bill of sale.

READY!
NEW CATALOG NO. 140
FOR 1946
WRITE FOR IT ON YOUR LETTERHEAD

THE HARRY ALTER CO.
1728 S. Michigan Ave. Chicago, Ill.
Two Big Warehouses to Serve You
134 Lafayette St. New York, N. Y.

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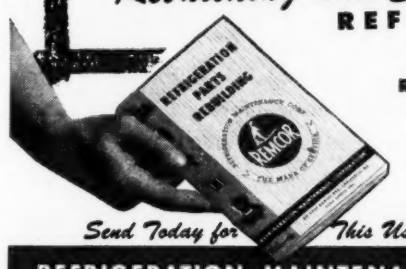

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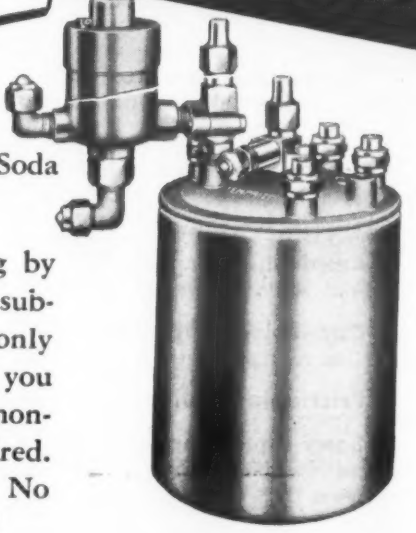

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Refrigeration Problems
And Their Solution

By P. B. Reed

For Service and Installation Engineers

Manager, Refrigeration and Air Conditioning Division, Perfex Corp.

Temperatures, Pressures And Heat Content In Compression Cycle (2)

(Continued from the Jan. 14 issue of the NEWS)

WHERE VOLUMETRIC EFFICIENCY ENTERS

This compressor, however, would not do the job, for we have not taken efficiency into consideration, that is, we have assumed that this compressor is 100% efficient, which, of course, no compressor is. The compressor will have some losses and consequently will pump only about 80% as much vapor as its volume (generally referred to as its "displacement").

So in order to actually pump .68 cubic inch per revolution the displacement per revolution of the compressor would be .68 ÷ 80% or .85 cubic inch. A single cylinder compressor with a bore of 1 inch and a stroke of 1 5/64 inch would, if 80% efficient, pump .68 cubic inch per revolution, 1,187 cubic inches per minute (1,750 revolutions), .687 cubic feet per minute, or 41.35 cubic feet per hour, which would be necessary in order to pump the 22.1 pounds of "Freon-12" entering the compressor at 65° superheated from 0° and at a pressure of 9.17 p.s.i. gauge.

The percentage of vapor that a compressor will actually pump, of the displacement of the compressor, is called its volumetric efficiency. The 80% used in the example is reasonably good volumetric efficiency. Volumetric efficiency cannot be accurately calculated, for it depends upon losses inherent in the design and construction of the compressor itself. Volumetric efficiency is best determined from actual test.

COMPARISON BETWEEN 0 AND 20° EVAPORATOR CONDITIONS

For purposes of comparison and further study, let us, for a moment go back to the evaporator and assume that, instead of operating it at 0°, we will operate it at 20° superheated to 65° at the compressor, and we will assume the same load of 19,200 B.t.u. per 24 hours. Also, we will use the same compressor and assume the same volumetric efficiency of 80%.

Our tables of superheated "Freon-12" vapor tell us that 20° saturated vapor superheated to 65°, has a volume of 1.244 cubic feet per pound. The 20° vapor is much heavier than the 0° vapor, so our compressor, which has a displacement of .85 cubic inch per revolution can actually pump 41.35 cubic feet per hour or 33¼ pounds of refrigerant per hour (41.35 ÷ 1.244).

The latent heat of vaporization of "Freon-12" at 20° is 67.94 B.t.u. per pound. The heat of the liquid at 70° is 23.90 B.t.u. per pound, and of 20° liquid, 12.55 B.t.u. per pound, a difference of 11.35 B.t.u. per pound, a difference of 11.35 B.t.u. per pound to be removed to cool the liquid from 70 to 20°. This leaves a net refrigerating effect of 56.59 B.t.u. per pound of the 20° refrigerant.

If the compressor can pump 33¼ pounds per hour of 20° vapor superheated to 65° (compared to 22.1 pounds per hour of 0° vapor superheated also to 65°), and if each pound has a net refrigerating effect of 56.59 B.t.u. per pound, then the refrigerating ability of "capacity" as it is called, will be 33¼ × 56.59 or 1,882 B.t.u. per hour, compared to the 1,200 B.t.u. per hour when it was working on a 0° evaporator. On the 20° evaporator it would not need to run but 19,200 ÷ 1,882 or 10 hours 12 minutes, instead of 16 hours out of the 24, in order to refrigerate this refrigerator with a 20° evaporator instead of a 0° evaporator.

COMPRESSOR CAPACITY IS GREATER WITH INCREASED SUCTION PRESSURE

From this we learn that, other conditions remaining approximately equal, the refrigerating capacity of a compressor or of a condensing unit (which consists of a compressor and means of running the compressor, such as an electric motor, plus a condenser, a base and perhaps a receiver and control) increases with the suction pressure, and this goes up with the evaporator temperature.

Reducing the evaporator temperature and suction pressure (perhaps by using a smaller, cheaper evaporator) lowers the compressor capacity, causes the compressor to run longer and to increase the overall cost of operation. As will be noted from the foregoing, the main reason for this increase of compressor capacity with increase in suction pressure and evaporator temperature is the fact that the vapor is more dense (weighs more) at the higher temperatures than at the lower temperatures, and consequently the compressor can pump more refrigerant, by weight, than if the refrigerant were colder, lighter, and at lower pressure.

Added to this condition is the fact that the *net* refrigerating effect of the refrigerant is greater at the higher evaporator temperatures, because less heat is required to cool the liquid itself down to evaporator temperature in the case of the higher temperature evaporator.

TRACING THE 0° VAPOR SUPERHEATED TO 65° THROUGH THE COMPRESSOR

Let us go back to the 0° evaporator and see what happens to the vapor, its pressure, its temperature, and the amount of heat in it after it goes through the compressor, while it is in the condenser, and finally, after it leaves the condenser as a liquid.

It will be recalled that the liquid at 70°, and at a pressure of 99.6 p.s.i. gauge, had 23.90 B.t.u. per pound of heat in it. It also had an ability to evaporate and take up 69.96 B.t.u. of heat per pound in so doing. Of this ability 15.65 B.t.u. per pound went for cooling the 70° liquid down to 0°, leaving the liquid with a net refrigerating ability of 54.31 B.t.u. per pound. Left in the 0° liquid was 8.25 B.t.u. per pound,

(Concluded on next page)

6 valves in 1

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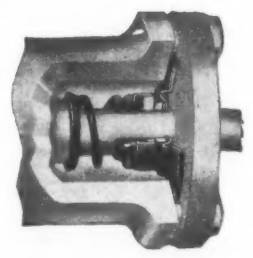

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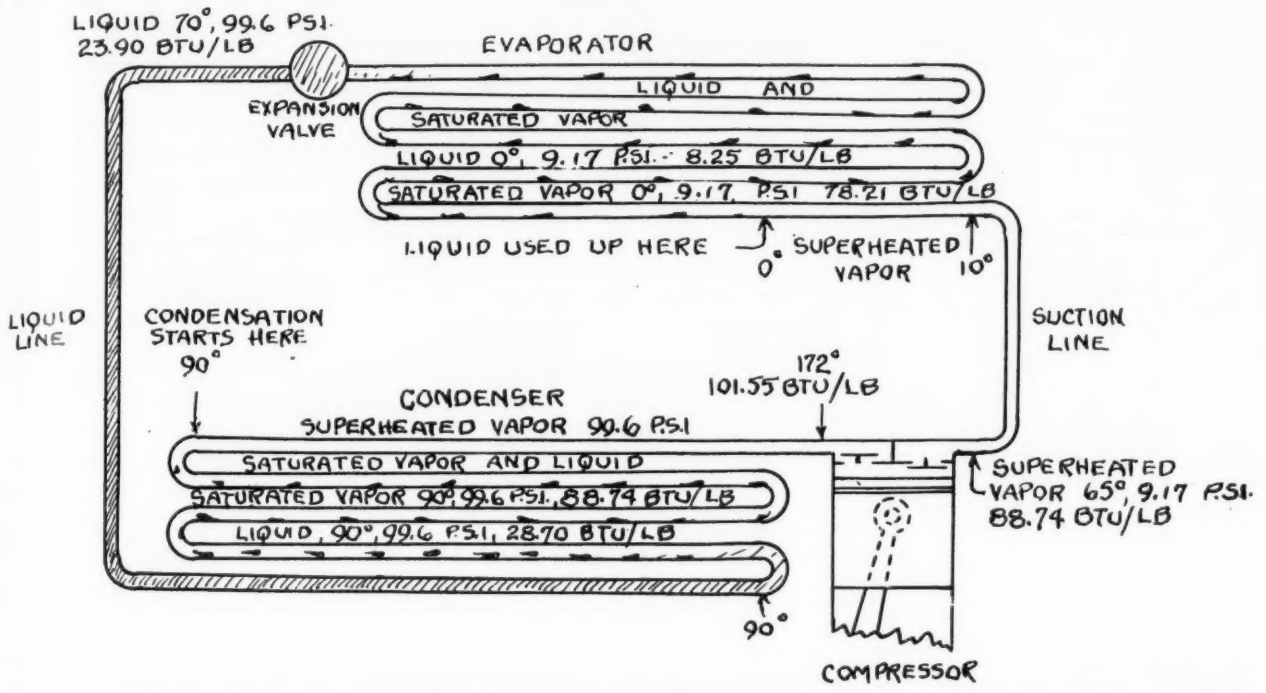
How Temperature, Pressure, and Heat Content Change in System



The above diagram shows the temperature, pressure, and heat content changes as the "Freon-12" refrigerant passes from one part of a compression system to another, picking up heat in the evaporator, suction line, and compressor, and losing heat in the condenser and liquid line. While it is gaining heat the pressure is low; while it is losing heat the pressure is high.

Effect of Compression Cycle on Refrigerant Temperatures, Pressures, Heat Content

(Concluded from preceding page)

and to it was added the 69.96 B.t.u. per pound, so that when it all became a saturated vapor about to leave the evaporator, it had 78.21 B.t.u. of heat per pound in it.

In the latter part of the evaporator and in the suction line back to the compressor the saturated vapor picked up 9.53 B.t.u. of "superheat" and 65° increase in temperature, arriving at the compressor superheated to 65° and with 87.74 B.t.u. of heat per pound (78.21 plus 9.53). When it dropped from 70° to 0° it also dropped from 99.6 p.s.i. gauge to 9.17 p.s.i. gauge and remained at that pressure all through the evaporator and the suction line, during the saturation stage and the superheat stage.

RATIO OF COMPRESSION

In the compressor it is compressed and its pressure raised from 9.17 p.s.i. gauge to 99.6 p.s.i. gauge or, from 23.87 p.s.i. *absolute* to 114.3 p.s.i. *absolute*. The number of times its pressure was raised is 114.3 ÷ 23.87 or 4.8, and 4.8 to 1 is known as the ratio of compression.

HEAT OF COMPRESSION

The 65° vapor has its pressure raised about five times, and is then pushed out into the condenser. In being pumped through the compressor it has had work done on it by the motor, and this work energy is transformed into heat. This heat added to it raises its temperature. It goes with 87.74 B.t.u. per pound in it and comes out with 101.55 B.t.u. in it. The difference, 13.81 B.t.u. per pound, is called the "heat of compression."

LOSES ITS HEAT OF COMPRESSION

The hot gas coming out of the compressor at 172° is over 100° warmer than the room. This large temperature difference causes the hot gas to cool rapidly until it loses this "heat of compression." After it has done this it still has 87.74 B.t.u. of heat per pound in it (101.55 — 13.81), but it is ready to condense if it loses any more heat. Also, it has dropped to 90°.

LOSES ITS LATENT HEAT

It does lose more heat. That is what the condenser is for, to cause the hot high pressure vapor to lose heat to the somewhat cooler room air. The latent heat of condensation is the same amount as the latent heat of vaporization at the same temperature. If, at the saturation temperature of the vapor, the latent heat is lost, the vapor changes to a liquid at the same temperature, that is, it condenses. If heat is added to the liquid at this same temperature, it boils and changes to a saturated vapor.

The latent heat of vaporization of "Freon-12" at 90° (also its latent heat of condensation) is 59.04 B.t.u. per pound (again from the tables). So for every 59.04 B.t.u. that the 90° gas loses, one pound is condensed to a liquid, still at 90°. Before it started to condense it had 87.74 B.t.u. in it; it lost 59.04 B.t.u., so the 90° liquid (still at 99.6 p.s.i. gauge) has 28.70 B.t.u. in it (87.74 — 59.04). Our tables show us that this is the heat that 90° liquid "Freon-12" should have in it.

LOSES HEAT OF LIQUID 90 TO 70°

By the time the liquid has gone on through the condenser, the receiver, and the liquid line, up to the expansion valve, it has cooled on down to room temperature of 70°. In losing the 20° it has also lost some heat, 4.8 B.t.u., in fact, which is the difference in the specific heat of "Freon-12" liquid at 90° and at 70°.

BACK TO WHERE WE STARTED

Finally at 70° and still at 99.6 p.s.i. gauge, it is about to enter the evaporator with its 23.90 B.t.u. that it started with several paragraphs back.

For the sake of clarity and of simplicity, some factors have been ignored and some points have been omitted, that would have been interesting perhaps, but not necessary to a practical understanding of the inter-relationship of temperatures, pressures, and heats in a compression cycle.

Chevalier To Distribute Ebco In Northern N. J.

JERSEY CITY, N. J.—Edward J. Chevalier, Inc., has been appointed distributor for the complete line of Oasis electric water coolers for the northern New Jersey territory by Ebco Mfg. Co., it was announced. Showrooms and offices are located at 3010 Hudson Blvd. here.

This firm, recently organized by Edward J. Chevalier, is also a distributor for McQuay, Inc., of Minneapolis, Minn., handling the McQuay line of refrigeration and air conditioning equipment.

Mr. Chevalier was formerly sales manager for Krich-Radisco of Newark, N. J.

Gray To Manage Nelson Sales In Southeast

JACKSONVILLE BEACH, Fla.—Ronald D. Gray's appointment as southeastern sales manager for the C. Nelson Mfg. Co. of St. Louis, has been announced by A. J. Leiweke.

Mr. Gray was employed as manager of the commercial refrigeration department of the Westinghouse Electric Supply Co. for Miami, Tampa, and Jacksonville, prior to his affiliation with the Nelson organization.

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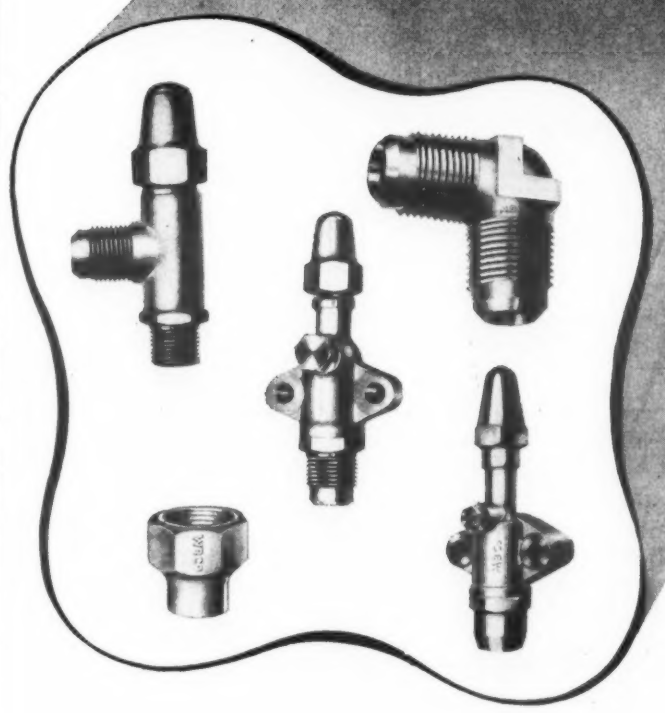

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Airliners DO Need Cooling In Stratosphere Flights, Engineer Says

Numerous Special Problems Encountered In Airplane Cooling Designs Discussed

By Bernard L. Messinger, Group Engineer, Thermodynamics, Lockheed Aircraft Corp., Burbank, Calif.

The Lockheed Constellation was the first transport aircraft to include refrigeration equipment as part of its air conditioning system. This system, which was conceived as part of the initial airplane design in 1939, also pioneered the application to aircraft of such features as the recirculation fan and heated cabin wall panels.

The original refrigeration equipment was of the vapor compression type and was designed and developed by Lockheed. This development was interrupted by the United States' entry into the war at which time the Constellation airplane underwent numerous design changes to adapt it to the requirements of a military transport. In the course of these changes the refrigeration equipment was deleted.

'MOST COMFORTABLE AIRPLANE'

In the early part of 1945 when the airplane design was being again revised, this time to conform to its original purpose as a commercial airline transport, it was decided to attempt to make it the most comfortable airplane that would be available to the airline industry.

All of the original air conditioning features as well as several new ones have therefore been incorporated into an entirely new system. The scope of the operating conditions has been increased to meet every conceivable requirement that the airline operators have voiced. The result is a very complete and yet flexible system.

A design analysis of the entire air conditioning system is beyond the scope of the present paper. Although the heating and ventilating functions involve several novel and interesting arrangements of equipment and ducting, it was felt that a study of the refrigeration function would be of particular interest since it is an entirely new problem and involves the use of equipment which has been developed expressly for this application.

Experience gained during the development of the vapor cycle refrigeration equipment, indicated that it would be necessary to devise some new method of refrigeration for the rather severe requirements of an aircraft application. Partly as the result of related wartime development programs, it became apparent that an air-cycle refrigeration system could be designed for a very small expenditure of weight and space.

The new air conditioning system, therefore, will employ an air-expansion-turbine unit in place of the vapor-compression unit which was included in the original version of the airplane.

It is the primary purpose of this paper to justify the selection of the air cycle as the most practical type of refrigeration for application to pressurized transport aircraft. The air cycle will be compared with two other possible methods. The use of the Constellation airplane for the purpose of illustrating the application of these methods, is incidental. In the opinion of the author the conclusions are applicable to all pressurized transport aircraft of comparable size and service.

PASSENGER COMFORT NOW MORE IMPORTANT

The aircraft industry has just recently reached that stage in its development where the subject of passenger comfort is receiving a degree of attention that is comparable to that which was formerly devoted entirely to the external performance of the airplane.

Prior to this time the aircraft industry has assumed that the airline traveling public would be content to accept a certain degree of discomfort in exchange for faster transportation. The recent change in viewpoint stems mainly from the recognition of the fact that the majority of the potential airline customers will no longer be willing to make this concession.

The tremendous growth envisioned for air transport within the next few years offers a new market for air conditioning. This fact is readily apparent in the accompanying article in which Mr. Messinger, an engineer of Lockheed Aircraft Corp., discusses the air conditions to be found in transport flights, particularly in the stratosphere and sub-stratosphere, and further describes designs and experiments in air conditioning aircraft. He stresses the extreme importance of weight in equipment designed for this application.

This article was prepared from a paper presented by the author at the recent national air transport meeting of the Society of Automotive Engineers.

In other words, the traveling public which has been exposed to comfort features such as air conditioning in the competitive forms of transportation, is now going to expect the same of airline transportation. This latter fact is particularly significant because airline transportation has been represented to the public as a superior means of travel and any discrepancy in this concept due to discomfort factors, will certainly have an unfavorable effect on the growth of its acceptance.

FACTORS AFFECTING COMFORT

Just to briefly review the various factors related to passenger comfort, the following items are listed:

(a) Temperature.
(b) Pressure (or cabin altitude).
(c) Rate of pressure change (or rate of climb and descent).
(d) Noise.
(e) Vibration.
(f) Air movement (or distribution).
(g) Ventilation (or oxygen supply).
(h) Humidity.
(i) Odor, dust, and smoke.
(j) Airplane attitude (angle and "bumpiness").
(k) Fixed equipment (seats, berths, lounges, lighting, etc.).

If the cabin pressurization equipment is considered a part of the air conditioning system, it can be seen that the latter exerts control over all of the comfort factors except (d), (e), (j), and (k).

In the case of item (j) the "bumpiness" can be diminished by making use of the cabin pressurization equipment and flying the airplane in the relatively "smooth" air that prevails at high altitude.

Where short range hot weather operations are involved and the optimum cruising altitude is below 10,000 ft, the air is likely to be very "bumpy." Flights under these conditions will benefit greatly from a cabin cooling system which will tend to suppress airsickness by its psychological as well as physiological effect.

The control of noise and vibration, items (d) and (e), is receiving a great deal of study by all of the large airframe manufacturers.

COOLING IS VITAL

It is thus apparent that the overall control of passenger comfort depends on a variety of factors. Refrigeration, the subject of this paper, influences only two of these, namely, temperature and humidity, and yet without adequate control of these two, the significance of the remaining items is greatly diminished.

It is a common misconception among many engineers that aircraft air conditioning does not require refrigeration simply because airplanes can be flown at a sufficiently high altitude to avoid excessive ambient temperatures. That this is only approximately true for unpressurized aircraft and not at all the case for pressurized transports can be rather easily demonstrated.

The principal fault in the above concept is that on a design summer day, based for example on the Army maximum temperature-altitude relationship, a 75° F. ambient temperature is not attained until the airplane has reached an altitude of 7,000 ft. The existence of a 75° F. ambient static temperature does not mean that the cabin can be maintained at 75° F. without the removal of heat. There are two principal reasons for this.

First, there are numerous internal sources of heat in the cabin; among these are the occupants, the solar radiation through transparent surfaces, the various electrical devices such as radio equipment, inverters, motors, lights, and a slight effect due to thermal lag.

The second reason has to do with the difference between static and total temperature; or stated another way, the temperature rise due to stopping (relative to the airplane) air having an initial velocity equal to that of the free stream.

For the older type of transport which has a climb speed of 110 to 120 m.p.h., this latter factor amounts to only 2° F., but for present day aircraft it may amount to 5 or 6° F. during climb. In level flight it can become 15 or 20° F. As an interesting side-light it might be well to point out that in recent high-speed military fighters this temperature rise reaches 50° F., in level flight.

TEMPERATURE RISE

It should be noted that this effect is present not only in the air that is stopped while being brought into the airplane but also in the boundary layer which envelopes the entire external surface. The net practical effect is equivalent to placing the airplane in an atmosphere at a tempertaure very nearly equal to the total temperature.

Due to the above factors it is generally not possible to maintain the cabin temperature within less than 10° F. to 20° F. of ambient static temperature, even though adequate (one complete air change per minute) ventilation flow rates are provided. Thus at 7,000 ft. altitude on a summer day the cabin temperature would range between 85° F. and 95° F. Obviously at altitudes below 7,000 ft. even higher cabin temperatures result.

The relationship is not linear however, because the sensible heat liberated by the occupants diminishes as the cabin temperature approaches body temperature, 98.6° F.

INSULATED FUSELAGE CAN BE DISADVANTAGE

Although of minor significance, it should be noted that thermal insulation in the fuselage wall is a disadvantage in any such condition in which the cabin temperature is above ambient temperature since it limits the amount of heat which can flow outward.

One very significant aspect of the airline operator's problem involves the elapsed time between the terminal and the point of take-off, as well as the corresponding ground maneuvering time after landing. This time element is quite variable.

For large airports operating with a heavy flow of traffic the time required to obtain clearance from the control tower has on some occasions resulted in causing airplanes to stay on the ground for as much as 30 minutes after leaving the terminal.

PSYCHOLOGICAL EFFECT

From the standpoint of the psychological effect on the passenger, particularly a new airline customer, the conditions which prevail in the cabin at the beginning and end of a flight are of primary importance. If a passenger is subjected to discomfort factors such as high temperature, high humidity, poor ventilation, excessive noise and vibration, it is quite likely that the resulting unfavorable impression he receives during the first hour that he is in the airplane will color his overall reaction to the whole flight.

The foregoing discussion, which applies only to unpressurized aircraft, indicates the fallacy in the contention that refrigeration is unnecessary. In the case of airplanes in which pressurization begins at take-off, all of the above considerations are applicable, in addition to those contributed by the process of supercharging the cabin.

The effect of the latter is due to two factors: (1) the elimination of

(Continued on next page)

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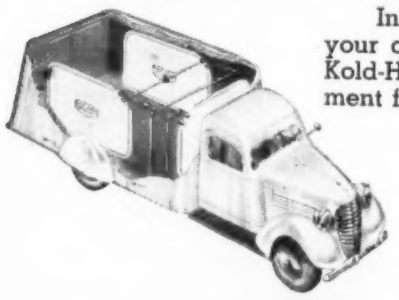

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Cabin Temperatures Can Be Uncomfortable

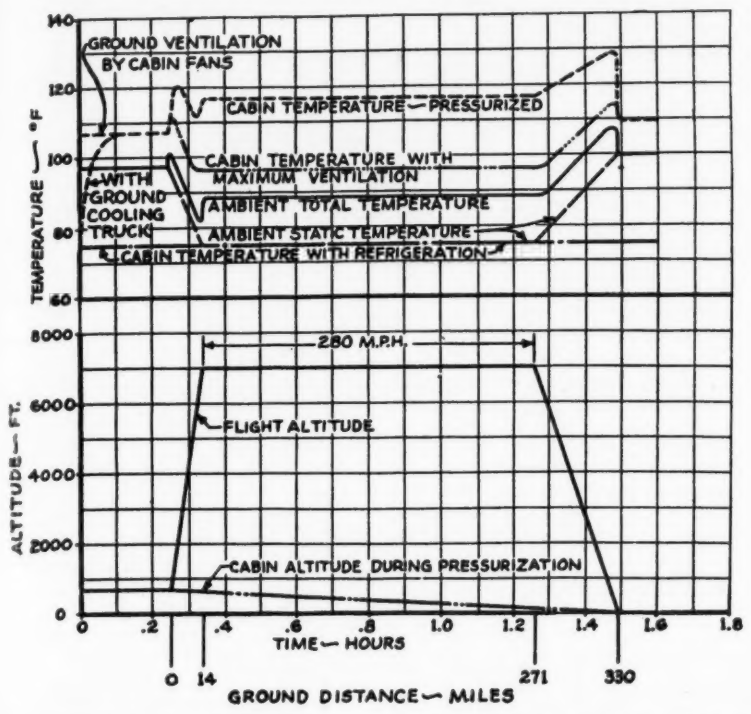

Fig. 1 shows the temperatures to be encountered in the cabin of a Lockheed Constellation airplane on a flight of 330 miles from Los Angeles to San Francisco on a typical summer day. Lower half of the graph shows flight altitudes. Upper half shows cabin temperatures with various cooling methods. Note that only refrigeration brings the temperature down to below 80° F.

Pressurized Cabins Need Cooling, Too

(Continued from preceding page)

the large ventilation flow rates as a result of the practical limitations of the superchargers, and (2) the fact that even when aftercoolers of high effectiveness are used, the air enters the cabin at a temperature somewhat higher than the ambient total temperature.

To illustrate the effect of providing an airplane with refrigeration equipment, Figs. 1 and 2 are shown. These two figures are based on two typical flight operations that will be encountered by the Constellation.

SHORT RANGE OPERATION

Fig. 1 is plotted for a short range operation in which the optimum flight is 7,000 ft. The altitude schedule is shown as a solid line in the lower portion of the graph. In the upper part all of the significant temperatures are plotted for (1) pressurized flight using intercoolers having 90% effectiveness, (2) unpressurized flight using maximum ventilation rates, and (3) pressurized flight using refrigeration.

In a flight at this moderate altitude the temperature conditions in flight are almost as severe as those on the ground. Pressurized flight without refrigeration would obviously be intolerable, and flight with maximum ventilation would be little better. For this type of operation the use of refrigeration contributes a very significant degree of comfort.

Fig. 2 is a similar plot for a nonstop trans-continental operation. For this condition a large proportion of the total elapsed time is at an altitude at which cooling by refrigeration is ordinarily not required. On an "Army summer day," however, it is apparent that even at 20,000 ft. some cooling is required in order to bring the cabin temperature from 86° F. down to 75° F.

Because unpressurized commercial operation is possible only below 12,000 ft. and preferably below 8,000 ft., the use of the ventilation system is shown for the ground maneuvering period and the period required to climb to 8,000 ft. If the climb is made in the unpressurized condition, the cabin rate of climb is equal to that of the airplane and may cause passenger discomfort unless the airplane flight plan is governed to avoid the latter.

COOLING ON THE GROUND

During the ground maneuvering period of both flight plans the only alternative to refrigeration which has been indicated is the use of the cabin fans as a means of ventilation. It would be entirely impractical to introduce supercharged air into the cabin in the absence of refrigeration while on the ground since the low effectiveness of the aftercoolers during this period would result in a cabin temperature of at least 130° F.

The foregoing discussion clearly demonstrates why airplanes are as much in need of refrigeration as any of the other forms of transportation.

The design conditions for the Constellation were established after the manufacturer and the airline operators had jointly reviewed the significant operating requirements which would be met in service.

The resulting requirements which have been used are:

1. The airplane refrigeration system is to be capable of delivering the required capacity in flight or on the ground as long as both outboard engines are operating at 1,000 r.p.m. or more.

2. A ground truck or its equivalent is considered acceptable for refrigeration of the airplane while it is parked without engines running. The truck is to be as simple and free of service problems as possible.

3. The refrigeration equipment is to be quickly removable as a unit so that during winter operation a negligible weight penalty will be charged to this system. This provision also permits easy access to the equipment for maintenance purposes.

4. The design ambient temperature is to correspond to the army summer day plus the adiabatic rise.

5. An absolute humidity of 109 grains per ponud of dry air is the design value at sea level. This corresponds to a relative humidity of 38% which was considered constant for all altitudes up to 20,000 ft.

6. The minimum design cabin dry bulb temperature is to be 75° F. and the cabin absolute humidity 78 grains per pound of dry air or 60% relative humidity.

7. The design calculations are based on carrying 60 occupants although the normal number for the commercial version of the airplane is 54, including a crew of six. One alternate arrangement provides for 64 passengers.

8. The minimum supply of outside air is to be 50 pounds of air per minute which is based on a consideration of the odor and smoke control problems.

Fig. 3 shows the variation in cooling load with altitude during climb. The components of the cabin space load are indicated by the various shaded areas. The convergence of the overall load curves at 10,000 ft. is the accidental result of the fact that at this altitude the required airflow rate through the superchargers is the same for all three refrigeration methods.

Furthermore, the latent load becomes zero at this point, and the temperature of the air leaving the primary intercooler is equal to the cabin temperature so that the total cooling load is equal to the space load.

VAPOR-COMPRESSION CYCLE

The vapor-compression cycle is used in practically all commercial refrigeration applications. The only significant exceptions are the two vapor-absorption cycles, namely, the large ammonia-water systems which are generally used where adequate sources of waste heat and cooling water are available, and second, the Electrolux cycle which is limited almost entirely to the small loads encountered in domestic refrigerators. These latter applications, even when considered together, represent only a very small proportion of the total refrigeration capacity in use at the present time.

In terms of the energy consumed per unit of refrigerating effect, the vapor-compression cycle is by far the most efficient. It was because of this well known fact that Lockheed's initial refrigeration development pro-

(Continued on next page)

Cooling Load Varies as Plane Gains Altitude

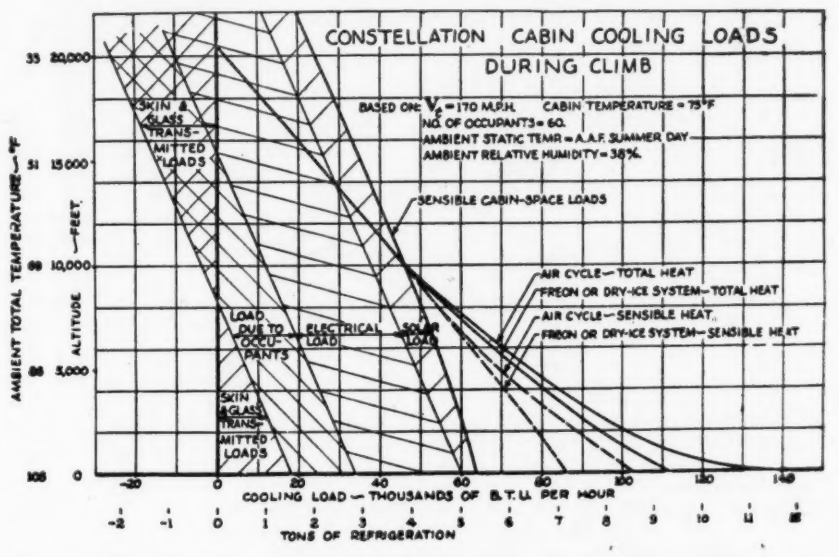
CONSTELLATION CABIN COOLING LOADS
DURING CLIMB
BASED ON: V_c = 170 M.P.H. CABIN TEMPERATURE = 75°F
NO. OF OCCUPANTS = 60.
AMBIENT STATIC TEMP. = A.A.F. SUMMER DAY
AMBIENT RELATIVE HUMIDITY = 38%
SKIN & GLASS TRANSMITTED LOADS
SENSIBLE CABIN-SPACE LOADS
AIR CYCLE—TOTAL HEAT
FREON OR DRY-ICE SYSTEM—TOTAL HEAT
AIR CYCLE—SENSIBLE HEAT
FREON OR DRY-ICE SYSTEM—SENSIBLE HEAT
LOAD DUE TO OCCUPANTS
ELECTRICAL LOAD
SOLAR LOAD
AMBIENT TOTAL TEMPERATURE — °F
ALTITUDE — FEET
COOLING LOAD — THOUSANDS OF B.T.U. PER HOUR
TONS OF REFRIGERATION

Fig. 3 indicates the variations which occur in cooling loads of the Constellation in climbing from ground level to 20,000 ft.

Temperatures on Flight from Los Angeles to N.Y.C.

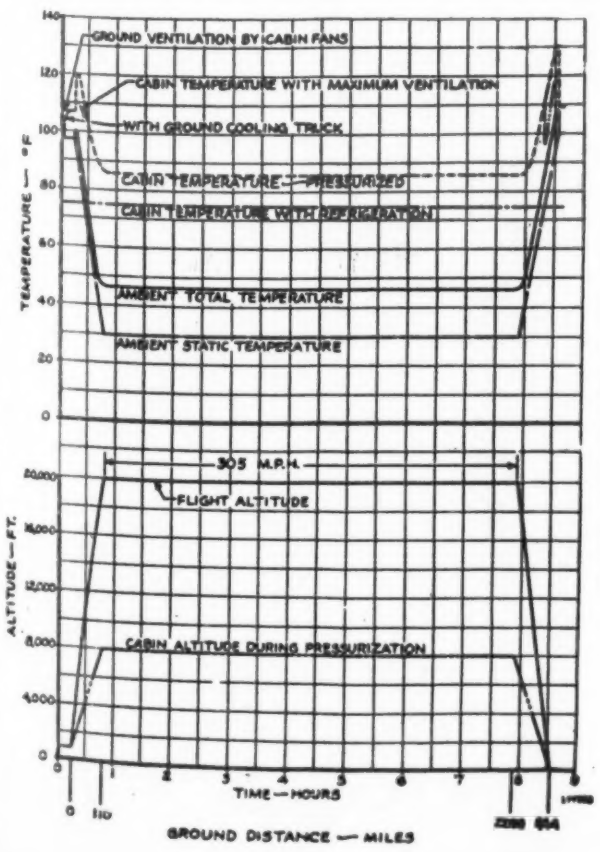

Fig. 2—Cabin temperatures of the Lockheed Constellation plane on a flight from Los Angeles to New York City are shown graphically at left. Refrigeration is required even at the cold outside temperatures which exist at 20,000-ft. altitudes.

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'Best Arrangement' of a 'Freon-12' System

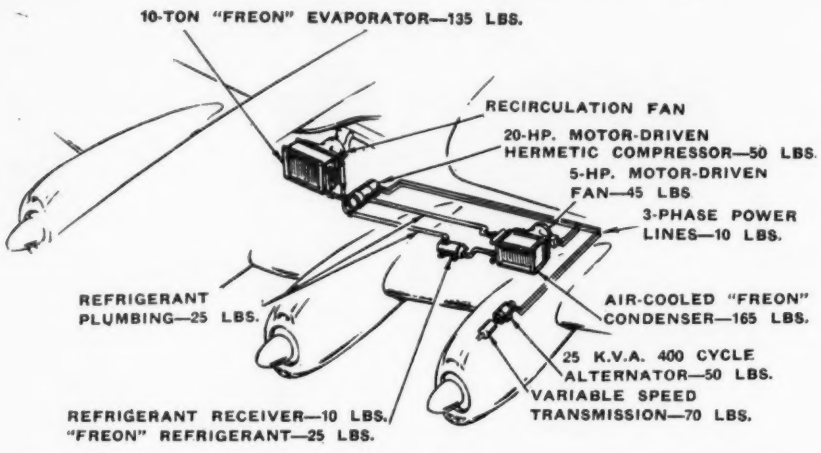


Fig. 4 is, in the author's opinion, the optimum arrangement of a "Freon-12" cooling system for the Constellation plane. Note weights of the various parts of the system.

Compression Cycle Was Tested First

(Continued from preceding page)

gram was directed toward this type of equipment.

There are three essential parts to a vapor compression system: (1) the evaporator in which refrigerant is evaporated at the expense of heat which is removed from the air being cooled, (2) the compressor which pumps the vaporized refrigerant from the low-pressure evaporator to a higher pressure at which it can be condensed by ambient temperature air in (3) the condenser which rejects the heat of refrigeration and compression to the surrounding atmosphere.

In the installation of the orginal Constellation experimental refrigeration system, the evaporator or cooling coil was located in the cargo compartment below the cabin floor. Air was drawn through the coil by a blower located in the box to the left of the coil, after having passed through air filters mounted in the section upstream of the coil. After leaving the blower, the air is mixed with outside air from the superchargers and then distributed throughout the cabin.

The compressor and condenser were both located in the aft wing fillet just outboard of the fuselage. The compressor was a high speed reciprocating type, powered by a hydraulic motor designed as an integral part of the unit.

The refrigerant, "Freon-12," was pumped by four double-acting pistons each of which was directly connected to a corresponding single acting hydraulic motor piston, the rod connecting the two pistons being fitted with chevron seals for both refrigerant and hydraulic fluid.

The only rotating element was a rotary valve in the center of the unit which was driven by a wobble-plate at the lower end of the motor. The valve shaft served for both compressor and motor.

The condenser was built of aluminum tubing having integral spiral fins. The tubing was formed into three helical coils placed concentrically around a cylinder which served as the refrigerant receiver or reservoir.

Cooling air was supplied by a duct from a scoop located on the lower surface of the wing root and left the airplane through a thermostatically positioned exit grille in the upper surface of the aft fillet. It should be noted that no condenser cooling air was available except during flight.

Due to the fact that the elements of the system were closely coupled, the "Freon" plumbing was not very extensive and copper tubing and fittings were used throughout to permit soft solder sweat-joints.

'FREON' SYSTEM CONTROLS

The overall output of the refrigeration system was modulated by a throttling valve in the hydraulic supply line to the motor of the compressor. This valve was positioned according to the demand of the main cabin thermostat.

Dry weights are 33 pounds for the evaporator, 13 pounds for the motor-compressor unit, and 16.7 pounds for the condenser. The weight of all of the remaining refrigeration components, including the "Freon-12" refrigerant, is approximately 35 pounds. The total for the system is therefore about 98 pounds.

The design operating conditions for the "Freon" system were 40° F. evaporator temperature and 140° F. condensing temperature. The capacity of the system by actual test under these rather severe conditions ranged between 1.25 to 1.5 tons, which was admittedly below the moderate requirements to which it had been designed and far below the required capacity indicated in Fig. 3.

The evaporator undoubtedly had an ultimate capacity of about 2.5 tons, and during the test it was evidently restricted by the limitations of the compressor and condenser elements.

An adjusted weight for the system based on an output of 1.25 tons would therefore include a deduction of half the evaporator weight or a new total of 82 pounds. This corresponds to about 65 pounds per ton of capacity, not including any allowance for a portion of the weight of the engine-driven hydraulic pump used to supply power to the compressor. This type of system does not meet the present airline requirement for cooling the airplane on the ground.

In the light of experience gained in the Lockheed development program and also in order to meet present requirements of performance and maintenance, the author is of the opinion that the optimum arrangement of a "Freon" system would be roughly as illustrated in Fig. 4.

To be consistent with the requirements shown in Fig. 3, the nominal rated capacity of this system would be about 10 tons. The three basic components are again evident in Fig. 4, but in this case they are considerably larger than in the early system. Note that the increase in evaporator size consumes valuable additional cargo space.

The compressor is of the hermetically sealed type in which the alternating current driving motor is submerged in the refrigerant atmosphere. Due to the high condensing temperature, the power required of the motor is about 17 hp.

In order to permit operation while the airplane is not in flight, an elecric-motor-driven fan is shown for cooling the condenser. The approximate power required for this fan is 5 hp.

Control of the system's output is accomplished by variation of the speed ratio of the transmission in response to the demand of the cabin thermostat. Allowing for an efficiency of 80% for the alternator and also for the transmission, the power taken from the engine would range between 40 and 50 hp.

Note that this installation does not permit simple access and removability. In order for this requirement to be met, the evaporator, compressor, and condenser would have to be built into a single unit. Although the evaporator and compressor could be combined into a single installation, it is very doubtful that the condenser cooling air

(Continued on next page)

Equipment Involved in a Dry Ice System

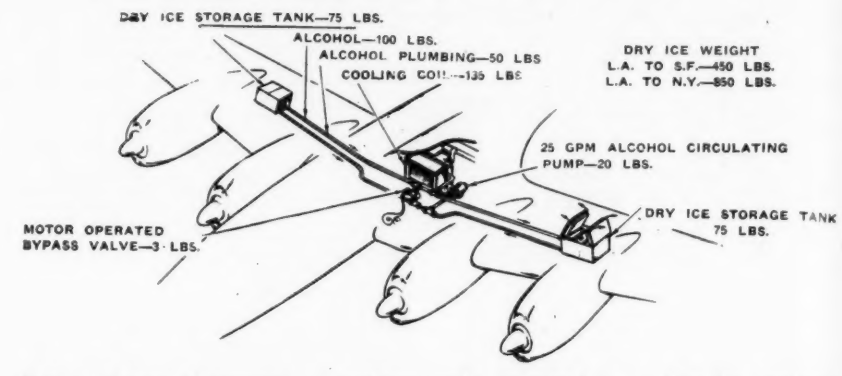
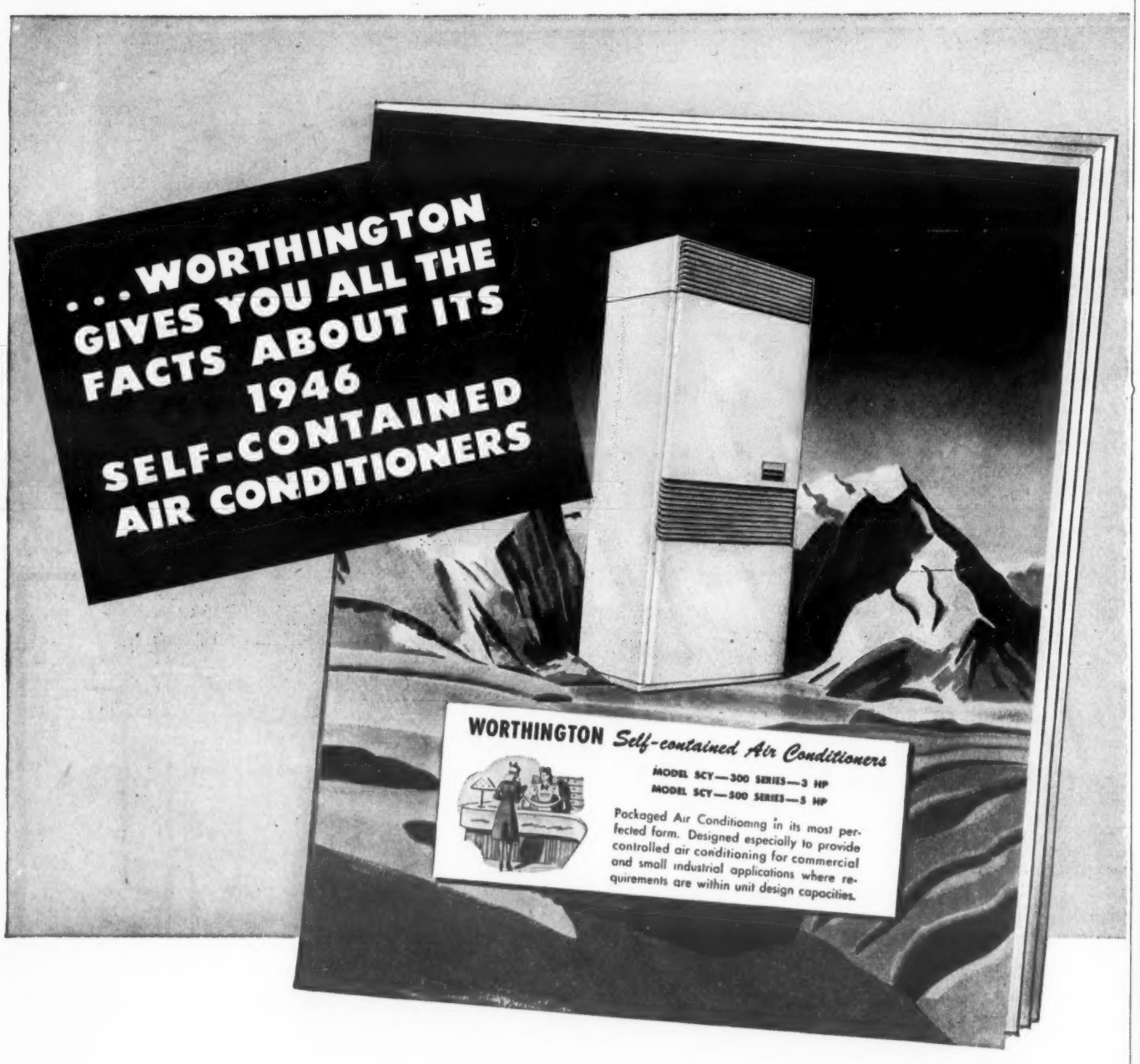

DRY ICE STORAGE TANK—75 LBS.
ALCOHOL—100 LBS.
ALCOHOL PLUMBING—50 LBS
COOLING COIL—135 LBS
DRY ICE WEIGHT
L.A. TO S.F.—450 LBS.
L.A. TO N.Y.—850 LBS.
25 GPM ALCOHOL CIRCULATING PUMP—20 LBS.
DRY ICE STORAGE TANK 75 LBS.
MOTOR OPERATED BYPASS VALVE—3 LBS.

Fig. 5 shows placement of various units involved in a dry ice system.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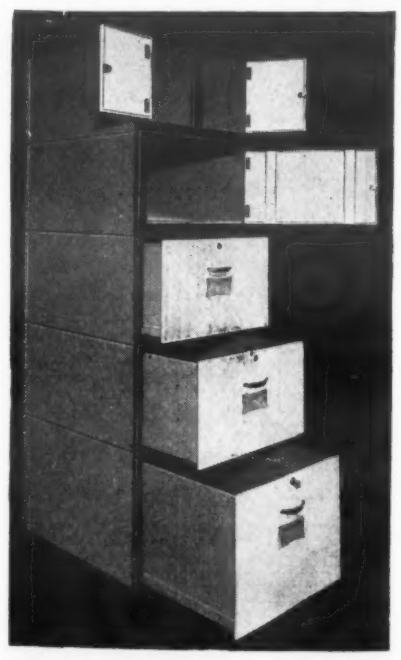

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Air Refrigeration Cycle Chosen for Constellation

(Continued from preceding page)

supply arrangement would pemit the location of the latter inside of the fuselage, to say nothing of the further reduction in cargo space.

If a single unit installation were attempted outside the fuselage, it would be equally difficult to bring all of the recirculated air from within the fuselage to a single evaporator located outside and then return the air to the inside once more.

The total of the individual estimated weight components shown in Fig. 4 is 585 pounds or 58.5 per ton of capacity.

DRY ICE SYSTEM

The following description of a dry ice system has been included as being representative of the storage method of refrigeration.

The simplest form of this type of system would consist of a means for circulating cabin air over slabs of the frozen material. There are unfortunately several reasons why this arrangement would not be acceptable for use in this application. These are:

1. The surface area of the ice progressively diminishes during the melting process and thus reduces the heat transfer capacity.

2. Due to the low surface temperature, the condensation of moisture is greater than necessary. In the case of dry ice, the very low surface temperature causes the formation of an insulating blanket of frost, thus reducing the rate of heat transfer.

3. The use of dry ice, which has almost twice the refrigerating effect of water per unit weight, involves the liberation of a prohibitive volume of CO_2 gas during pressurized operation.

In order to avoid these objections, the simple system has been modified to include a cooling coil practically identical to the "Freon" evaporator of Fig. 4, and an alcohol circulating system to deliver heat from the coil to a dry ice storage tank. These elements are shown schematically in Fig. 5. The fact that two storage tanks are shown is merely to indicate that the required tank volume, including insulation, is greater than the space available on one side of the airplane.

BY-PASS CONTROL SETUP

Control is accomplished by a modulating by-pass valve in the alcohol system. The circulating pump would operate at constant flow as long as any cooling was required.

The sum of the approximate weights shown in Fig. 5 is 458 pounds exclusive of the dry ice itself which would weigh 450 pounds for the flight shown in Fig. 1 and 850 pounds for that of Fig. 2.

From the standpoint of ease of maintenance and removability, this system is at least no better than the "Freon" system of Fig. 4. There is the additional problem of handling the dry ice while charging the storage tank.

The air refrigeration cycle, which has been selected as most practical for the Constellation, found fairly widespread application during the early days of mechanical refrigeration. Today it is practically extinct in the commercial field. Its disappearance is due to the high degree of development experienced by the more efficient vapor cycle.

It is significant that the peculiarities of the airplane are such that a system of refrigeration which has been superseded in every other field of application proves to be the most practical of all in this particular field.

Fig. 6-A is typical of similar illustrations to be found in any standard thermodynamics textbook. In this arrangement, known as the open-type air cycle, external power is applied to the compression cylinder which draws air from the cold room at atmospheric pressure and discharges it into an aftercooler which removes the heat of compression.

The air then passes through the expansion cylinder which returns the work of expansion to the compression cylinder to thus augment the external power supplied. The heat equivalent of the work done in the expansion cylinder is in this way removed from the air which then enters the cold room at a low enough temperature to produce the required refrigerating effect.

Note that the same amount of cooling could be obtained by dissipating the work of expansion in a friction brake and supplying the work of compression entirely from the external source of power. This is illustrated in Fig. 6-B, and indicates the distinction between a regenerative system or, in recent military parlance, between a "bootstrap" and a "non-bootstrap" system.

TWO-STAGE COOLING

Fig. 6-C shows an arrangement which is functionally equivalent to that of Fig. 6-A. In this case, however, the compression process has been divided into two stages, the first of which obtains all of its power from the external source, and the second entirely from the expansion cylinder. Note that intercooling between stages is available in addition to the final aftercooling.

Except for the fact that new air, rather than recirculated air, is introduced into the compressor, the Constellation system is basically equivalent to this last arrangement.

The first application of turbo machinery to the air cycle, that the author is aware of, is shown in Fig. 7. In this case it is used by the General Electric Co. as a convenient method of obtaining air at a very low temperature for testing turbo-superchargers under high altitude conditions.

When it is realized that a device having the size of a standard aircraft engine turbo-supercharger has a refrigeration capacity of about 100 tons when used as shown in Fig. 7, it is apparent why this method becomes such an attractive solution for the airplane cooling problem.

After Lockheed had reached its decision to install an air turbine system in the Constellation, it was also decided to attempt to procure the necessary equipment from an outside vendor if possible. As the initial step in this program, a diagram was submitted to various manufacturers.

Of these, the Airesearch Mfg. Co. of Inglewood, Calif., was the only firm which showed significant interest in a program to develop suitable

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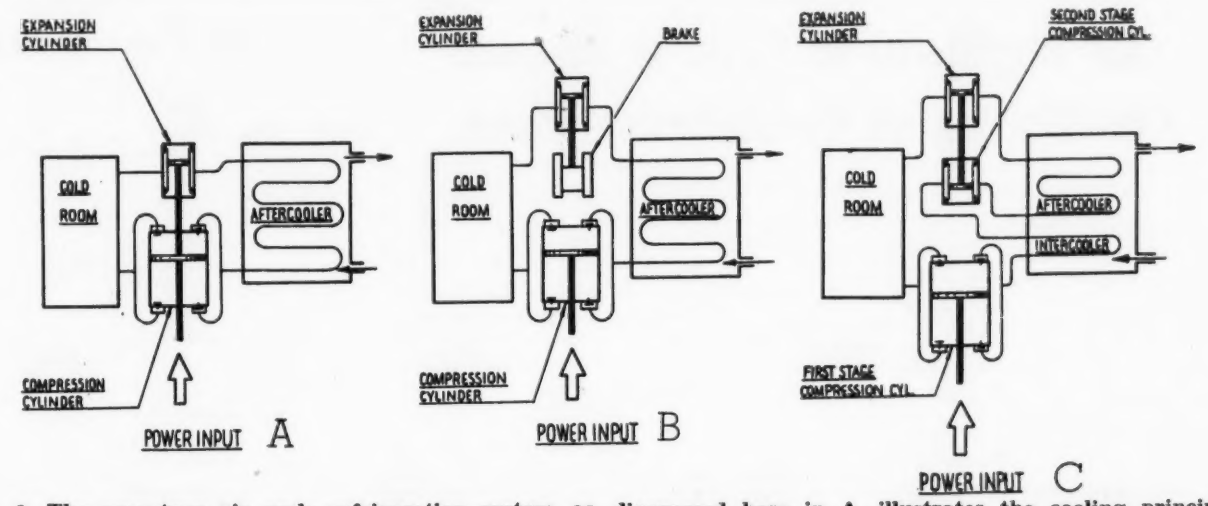
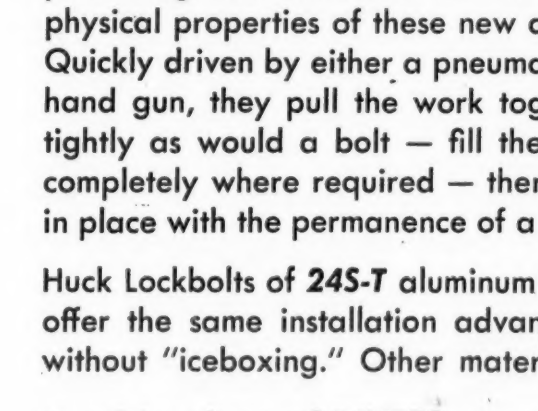


Fig. 6—The open-type air cycle refrigeration system, as diagramed here in A, illustrates the cooling principle which the author believes is most applicable to airplane air conditioning. A variation of the basic method is shown in B, while C is a two-stage system similar to the final design employed in the Constellation.



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COLLAR—Slips Freely Over Inserted Pin
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Used in place of BOLTS, Huck Lockbolts save much time and trouble. They are more quickly installed than bolts — eliminate lockwashers, cotterpins and nuts — provide hole-filling — assure uniform tightening — and fasten *permanently;* will not loosen under any conditions of vibration or fatigue loading.

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SPECIFICATIONS

Huck Lockbolts are available in two types—(1) for applications requiring hole-filling (to replace rivets and close-fitting bolts), and (2) for use in place of bolts in clearance holes. They are furnished with any type of head desired, and with pins of 24S-T or 75S-T aluminum alloy, carbon steel, or high-strength alloy steel.

Lockbolts are now available in 3/16" diameter with grip lengths ranging from 1/32" to 21/32" by 16ths. Lockbolts of 1/4" and 5/16" diameter will soon be available. Full information on request.

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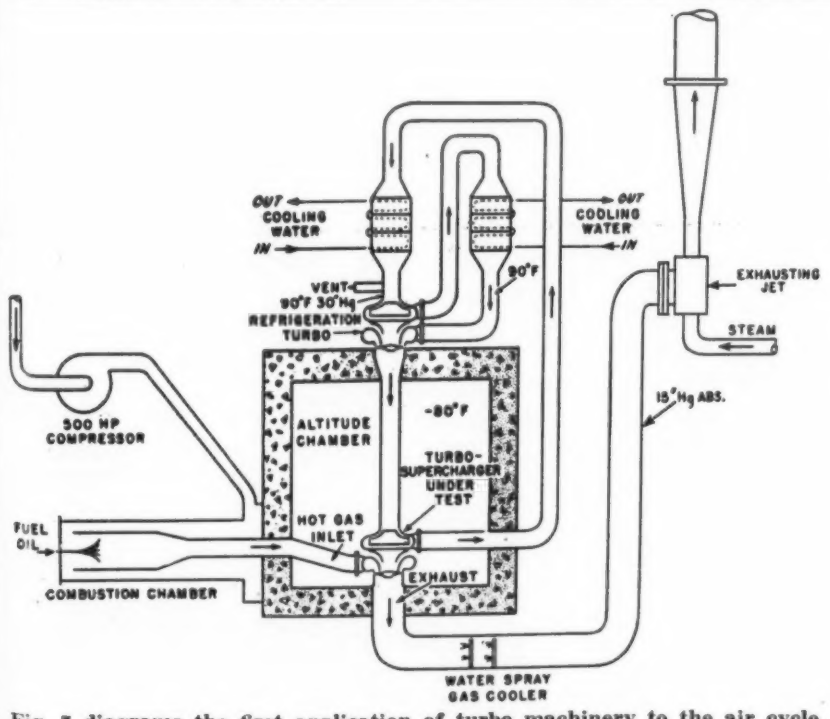


Fig. 7 diagrams the first application of turbo machinery to the air cycle, which was used by General Electric Co. to test turbo-superchargers at conditions of low temperatures and high altitudes.

How Air Refrigeration Cycle Is Adapted For Conditioning of Constellation Plane

(Concluded from preceding page)

equipment for this application. Considerable credit is due the management and engineering department of this company for their progressive attitude in this cooperative effort. All of the refrigeration equipment is contained in a single removable unit which requires no external connections other than those at the air inlet and outlet.

SOURCE OF POWER

No power is supplied to the unit by mechanical or electrical means. Power enters the system only through the cabin superchargers. These superchargers are no larger in capacity than if designed for pressurization alone. This is due to the fact that they are designed for high altitude inlet air density, and when operated at maximum speed at sea level they have the inherent capacity to supply the increased mass-flow required for maximum refrigeration.

Obviously there is an increase in the power required under this condition at sea level, and the transmission design is based on this maximum requirement.

In order to meet the airline requirement to be able to cool the airplane on the ground in the absence of ram, the author suggested the application of the turbine power to both the secondary compressor and the coolant air fan.

Prior to this solution it was common practice to either deliver the entire turbine power to the secondary compressor and depend on only ram air for cooling the aftercooler, or to wastefully deliver all the turbine power to an inefficient fan for supplying aftercooler coolant air, the latter fan acting more as an energy absorber than as a fan.

That this second method is very inefficient is apparent when the fan power and turbine power are compared. Because power is not fed "upstream" to a secondary compressor this method has been referred to as the "non-bootstrap" system.

The water separator is employed to remove about 60% of the entrained free moisture which, under design conditions, is condensed at the turbine. The remaining 40% will be evaporated during the process of mixing turbine air with recirculated cabin air, thereby making this latent cooling capacity available as sensible cooling in the cabin.

Control is accomplished by means of a simple bypass valve.

The actual airplane installation is more realistically illustrated in Fig. 9. This perspective drawing includes much of the ducting not directly related to the refrigeration system, therefore the latter has been darkened for greater clarity. The air enters the airplane through two flush scoops on the lower surface of each wing leading edge and is delivered to the primary centrifugal compressors which are located in the outboard nacelles.

These are driven from the main engines through variable speed transmissions which permit the full refrigeration capacity to be obtained at engine speeds down to 1,200 r.p.m. Although the transmission is not of the slip-pump type, a small oil cooler is required and is shown in the leading edge just inboard of each outer nacelle.

The discharge air from both compressors is ducted to a single primary intercooler located in the trailing edge section of the right hand wing. The removable refrigeration unit is located adjacent to the intercooler. From this point an insulated duct takes the cooled air through the water separator and then into the cabin distribution system.

Air Cooling System as Installed In Plane

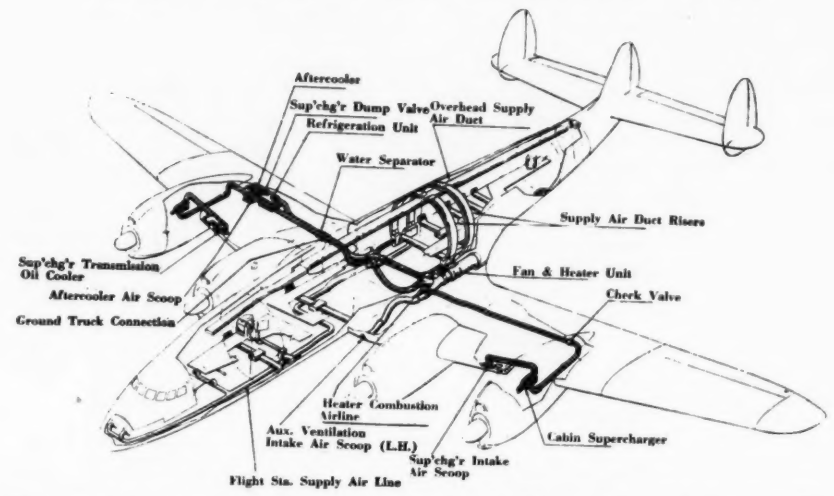


Fig. 8—Actual installation of the air refrigeration system in the Constellation is shown above.

DRIVING THE FAN

By separating the compressor and the turbine to permit locating the coolant fan between them, Airesearch engineers were able to greatly simplify the problem of driving the fan. A single right angle reduction gear transmits power from the turbine-compressor shaft to that of the fan. The heat exchanger is a two pass semi-counter flow type of tubular construction.

Coolant air is drawn through this aftercooler from a flush opening in the lower surface of the wing and then discharged horizontally aft from the fan through an opening in the trailing edge structure. The unit is shock mounted at the four lower corners and is quickly removable through the lower surface of the wing. A suitable section of duct will be provided to replace the unit during winter operation.

The overall dimensions of the unit are 18 in. high, 37 in. long (spanwise), and 27 in. deep. Its weight is 115 pounds. The estimated increment of the supercharger drive system weight that is chargeable to the refrigeration function is 100 pounds per airplane. The increase in the weight of the ducting is about 35 pounds, bringing the total weight to 250 pounds, or 25 pounds per ton of capacity, for a system that ideally meets all of the airline requirements.

GROUND COOLING PROBLEM

The problem of ground cooling without engines operating is simplified to the extent that it requires only a supply of compressed air about 15 p.s.i. gauge pressure. This can be furnished from a central compressor in the air terminal or from individual truck-mounted units. This truck arrangement is based on using a converted aircraft turbosupercharger as the compressor by replacing the turbine with a step-up gear train. A water-cooled truck-type engine is used as the power source. A single axial fan provides coolant airflow for the truck-mounted intercooler as well as the engine radiator. A 5 kilowatt generator supplies power for the operation of the cabin fans and other electrical equipment in the airplane.

It is apparent that the air cycle has a very definite advantage over the other systems when weight and space requirements are considered. From the standpoint of maximum power required, it is the least favorable of the three, although the duration of this maximum power load is short.

Statistics show that the average cooling load for the Los Angeles to New York operation is only 24% of the maximum. The corresponding average power required for the air cycle is 20% of the maximum power. For the Los Angeles to San Francisco flight the corresponding average values are 71% of maximum cooling and 58% of maximum power.

The relative amounts of fuel required to operate the equipment as well as that to transport it are also shown. Of much more significance than the amount of fuel to transport the equipment is the relative sacrifice in airplane revenue which would occur in long range operations whenever the payload is limited by the take-off gross weight of the airplane. No plot of this comparison has been shown, but it would be proportional to the weight of the equipment plus operating fuel.

From the standpoint of ease of maintenance, the air cycle is far superior to the other two systems for the following reasons:

1. The equipment is small and light and contained in a single, integral unit.

2. It can be located in an easily accessible part of the airplane which is remote from the cabin and incidentally releases valuable cargo space consumed by either of the other systems.

3. Because the air itself is the refrigerant, small amounts of leakage are tolerable in this system, while in the "Freon" or alcohol systems any leakage is serious.

4. No heat exchanger is used to cool the air, thus reducing the pressure-drop requirements of the cabin fans and eliminating the need for cleaning the coils that are used in both of the other systems.

5. Except for the coolant fan and its driving gear this unit could be considered a "one-moving-part" mechanism.

6. The cycle is so simple that no highly specialized training program will be required for the mechanics who will service this equipment.

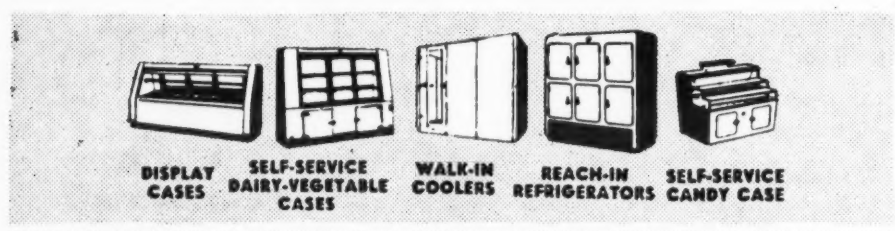
The air turbine refrigeration cycle has been shown to be the simplest, lightest, and most compact system for the purpose of air conditioning pressurized transport airplanes. This is due at least partly to the fact that the primary compressors are included as elements of the cabin supercharging equipment.

If the weight estimates of the "Freon" system are valid, there is reason to believe that even for an unpressurized airplane the overall weight of the air turbine system, including the entire burden of the primary compressors, would be slightly less than that of the "Freon" system.

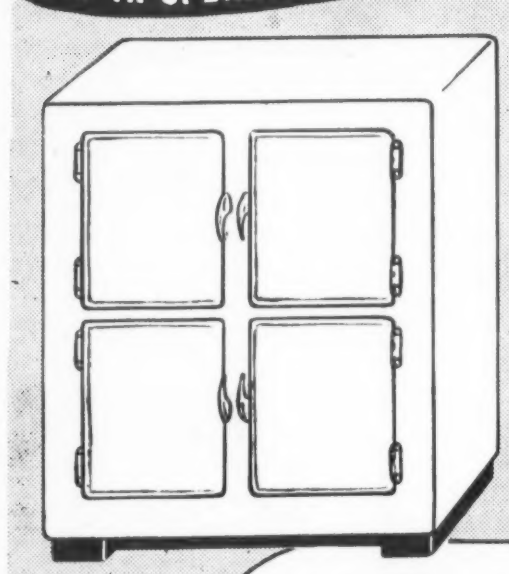
JORDON

AMERICA'S BEST COMMERCIAL LINE!

Refrigerators



BEST IN OPERATION • BEST IN VALUE • BEST IN DESIGN



NOW AVAILABLE R-42 REACH-IN

100% COMPLETE REFRIGERATION RANGE
42 CUBIC FEET—3 POPULAR STYLES

- NORMAL — Temp. 36° to 40°
- DUAL — Temp. 5° Ab. -35° to 40°
- LOW — Temp. 0° to 5° Ab.

Write now for full information concerning this dependable line of reach-ins.

DISTRIBUTORS WRITE NOW FOR INFORMATION ON AMERICA'S FINEST AND MOST COMPLETE LINE OF COMMERCIAL REFRIGERATORS

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SALES DIVISION
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FACTORY—PHILADELPHIA, PA.

BRUNNER REFRIGERATION HELPS YOU TO SERVE BETTER

When you buy a Brunner Refrigerating Condensing Unit you're buying *refrigeration,* not merely pounds of metal!

Brunner Refrigerating Condensing Units are designed and built along the lines of a unit that you, with your intimate knowledge of the essential requirements, said you must have. The result is a line of condensing units that reach a new high in the Brunner standard of perfection. Many changes were made to increase an already high efficiency, further reduce existing low operating costs, broaden their applications—while still holding price in line—and never losing sight of Brunner engineering integrity.

Whether your requirements call for a ¼ h. p. or 25 h. p. unit, air-cooled or water-cooled, there is a Brunner Condensing Unit designed to meet them.

They are all described and illustrated in the Brunner Refrigerating Equipment Catalog, which also contains valuable engineering data, information and tables. Write for a copy.

BRUNNER

BRUNNER MANUFACTURING CO.
UTICA 1, NEW YORK, U. S. A.

Strike--

(Concluded from Page 1, Column 5)

tives and resulting increases in labor costs," he averred.

"We feel that the time has come in this reconversion period to establish a basis of equal responsibility by the union as well as management in abiding by the terms of the controls. Evidence that this has not been the case throughout the war period is shown by the fact that there were 127 work stoppages in 14 Westinghouse plants from April, 1941, to December, 1945," he continued.

"These stoppages occurred because union representatives disagreed with settlements of grievances under the terms of our contract. Today's company-wide strike is ultimate proof that there can be no real collective bargaining under terms of the present contract," Mr. Marshall emphasized.

A. W. Robertson, chairman of the Westinghouse board, stated that Westinghouse could not improve its wage offer "without seriously hurting the company's ability to stay in business."

The company's offer, he pointed out, would have granted the workers a 15% increase in pay for a 10% increase in hours.

"For 44 hours the average Westinghouse hourly paid male employe would earn $60.72 per week. This will stand comparison with the published figures or offers of any other large company," declared Mr. Robertson.

Conceding that Westinghouse had enough cash to pay higher wages "for a short time," Mr. Robertson said that this money was needed for "larger and improved facilities and as protection against even rainier days than the reconversion period."

Charles E. Wilson, president of G-E, warned that his company must now suspend production and delivery of electrical equipment required for reconversion of industry and commercial establishments, and that an immediate affect will be seen in the appliance distribution.

"Without a backlog of appliances to carry dealers through the strike, it will be necessary for distributors, dealers, and consumers alike to wait for the flow of appliances to resume," declared Mr. Wilson.

Since the company was permitted by the government to begin reconversion, G-E has produced some 2,000,000 appliances, and of these about 95% has been shipped to distributors, with the balance going for exports, he said.

On the eve of the strike, G-E took large newspaper space to give the following message to its employes:

"If G-E employes strike, it will be a tragedy. Production will have to stop. Reconversion will be set back. And G-E families will lose a million dollars a day.

"We want you to know that we have done—and are doing—everything one company can do to prevent it.

"As an employe, you know that there has been no real 'labor trouble' at G-E in 24 years. During this period our company took the lead in pay increases. In the past 10 years alone, average hourly earnings for men climbed over 51%.

"On top of this we offered a 10% increase. The union officials rejected this suggestion—but made a counter proposal that we put the increase on a basis of cents-per-hour. We thought we had more than met this proposal when we offered 10 cents an hour increase for all those making less than $1 an hour, and 10% for those making more.

"This—with overtime urgently needed in 1946—would have made average 'take home' pay higher than in wartime!

"The next development came to us through the newspaper. We read that a strike had been called at General Electric to begin Tuesday, Jan. 15.

"We hope it won't happen. And it needn't happen. For our employes can gain nothing by a strike that they could not have gained while still at work."

In other newspaper advertisements, G-E plans similiar statements plus an outline of its program to hire twice as many workers as it had before the war, its schedule to increase production in all its plants, the purchase of six plants from the government, and the construction of seven new plants.

At Dayton, Ohio, Frigidaire Division of General Motors applied for an injunction last week against two locals of the electrical workers union so that non-union employes could gain access to the plant.

Similar moves have been made by GM's Delco Appliance Division in Rochester, N. Y.

Washington Institute Maps Year-Around Training In Sales

WASHINGTON, D. C.—The Electric Institute of Washington, trade association of the combined electrical industry in the nation's capital, announces a year-'round sales training program, open to all its members.

Believing the proper selection and training of salesmen to be more important than ever in view of the anticipated greatly expanded postwar market for electrical appliances and equipment, the institute has carefully planned a comprehensive and streamlined program which is scheduled to start in January.

Convinced that selecting personnel is equally as important as training it after it has been selected, creators of the course have prepared a brochure containing complete instructions on how to interview applicants to achieve maximum results. The folder eliminates haphazard hit-or-miss methods and reduces the selections to a science, the end result of which is reflected on a chart furnished with the booklet.

The program will open with classes for sales managers, designed to give them a streamlined version of the refresher sales information course to be given appliance salesmen beginning early in February. Rookie salesmen will first be given a course in basic sales principles. For those further advanced, a specialized course will be conducted to develop intensive product sales training.

Actual demonstrations will play a major role in the training process. Range salesmen, for instance, will be shown all the fine points pertaining to electric cooking in one series of lectures, and other series will take up laundry equipment, refrigeration, etc. Kitchen planning and adequate wiring facilities will be an integral part of the over-all program.

With sales managers trained to pick personnel and ample facilities to provide scientific training for appliance salesmen so chosen, the institute feels it will have an unbeatable combination for the important job of postwar selling.

Robert F. Mook will direct the program. He recently joined the staff of the Electric Institute as sales training director. He has many years of experience in the selling field behind him, having been with the Commonwealth Edison Co. of Chicago for several years, engaged in merchandise sales training.

Are You Getting Your Share of the Milk-Cooling Business?

WILSON

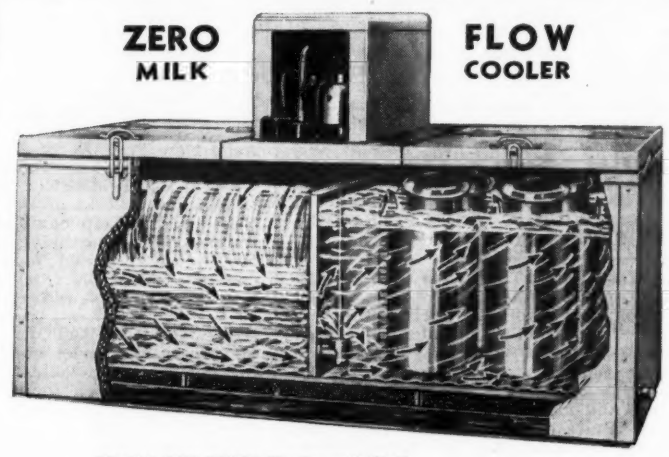
SYSTEMS OF MILK COOLING
A TYPE FOR EVERY REQUIREMENT
1. ZERO-FLOW MILK COOLER

The Wilson ZERO-FLOW Milk Cooler, in sizes to cool from 4 cans to 20 cans of milk daily, has set a high standard of milk-cooling speed, with economy and dependability throughout a long life. The 1945 ZERO-FLOW, engineered particularly for the use of refrigerating plates, continues the Wilson tradition of high performance in:

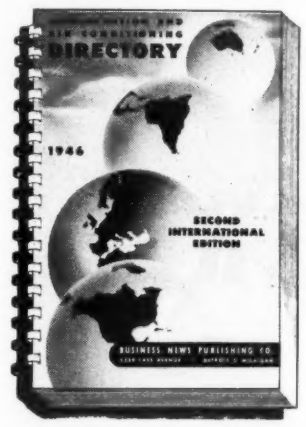
- RAPID AND UNIFORM COOLING
- MAXIMUM COOLING EFFICIENCY
- LOW COST OF OPERATION
- LIFE-TESTED CONSTRUCTION

If there is no Wilson Dealer near you . . . if you have an adequate sales-and-service organization . . . you can get your share of this tremendous business. Write NOW.

WILSON REFRIGERATION, INC.
DIVISION WILSON CABINET CO.,
Smyrna, Delaware



Model ZF8-HX50 Packaged-Unit



Many thousands of new people have entered the industry. Along with the industry's old timers (many of whom are expanding and seeking new sources of supply) they are eager buyers in search of goods to sell. So it will be profitable to use *more* DIRECTORY ADVERTISING this year, fully cataloging and illustrating your products and services. This Directory will be read more carefully, and consulted more often—by more buyers—than any we have published before.

2ND INTERNATIONAL EDITION—1946

Refrigeration and Air Conditioning Directory

BUSINESS NEWS PUBLISHING CO., 450 W. FORT ST., DETROIT 26, MICH.

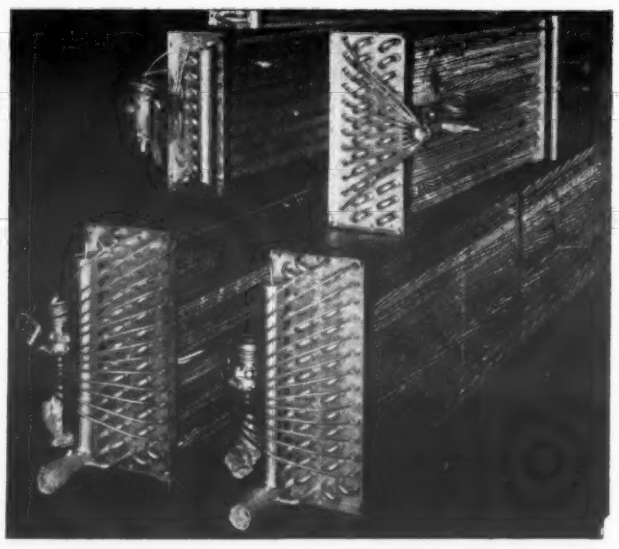
GUARANTEED 28,000 COPIES

TYPHOON PRODUCTS FOR YOUR AIR CONDITIONING NEEDS

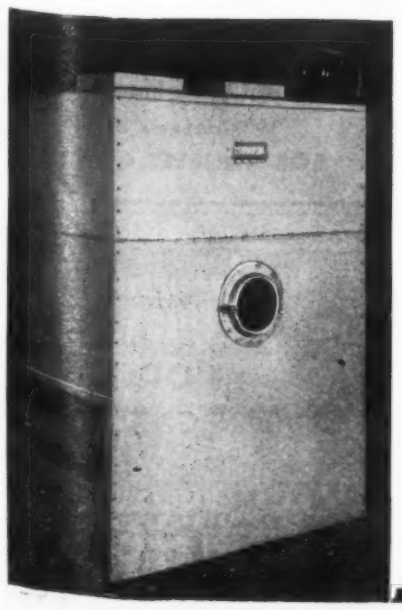
The ICE-AIR CONDITIONING CO., INC. is equipped to make prompt deliveries on all types of Monsoon Coils, fabricated in any size or shape required.

A line of tested TYPHOON air conditioning equipment for smooth performance in all types of conditioning systems is now also available in limited quantities.

Monsoon Direct Expansion Coils and Coils for Water Cooling—Available in a wide range of sizes with circuits designed to provide for even distribution of liquid. Immediate delivery.



TYPHOON Evaporative Condenser—Coil surface and air quantities designed to keep air pressure and power requirements to a minimum under toughest conditions of temperature and humidity. Compact, efficient, available in a range of sizes from 5 to 150 tons.



TYPHOON Products

- Prop-R-Temp Self-Contained Air Conditioning Units, 3 and 5 tons
- TYPHOON Evaporative Condensers
- TYPHOON Spray Coolers (Air Washers)
- Prop-R-Temp Air Conditioning Units
- Monsoon Heating Coils (2-Header and Non-Freeze Types)
- Monsoon Direct Expansion Coils
- Monsoon Water Coils (Continuous Tube and Free Drain Types)

Ice-Air CONDITIONING CO., INC.
794-6 Union Street, Brooklyn 15, N. Y.

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $2.50 per insertion. Limit 50 words.

RATES for all other classifications $5.00 per insertion. Limit 50 words.

Advertisements set in usual classified style. Box addresses count as five words, other addresses by actual word count.

PAYMENT in advance is required for advertising in this column.

POSITIONS WANTED

INDUSTRIAL ENGINEER, who knows markets and current changes therein through constant contacts with industries and confidential WPB assignments, both in the U. S. and abroad, is now available in a consulting, advisory, or directive capacity. Synopsis of training and business experience will be sent without obligation. Box 1905, Air Conditioning & Refrigeration News.

POSITIONS AVAILABLE

REFRIGERATION SERVICE MEN. $1.35 per hour, commission and mileage. Salesmen — commercial — excellent lines. Must travel 175 mile radius from store. Commission and retainer. ACME REFRIGERATION ENGINEERING, 236-240 17th St., Merced, Calif.

SAN DIEGO, California. Wright Refrigeration Service requires first class service men at $1.50 per hour with time and half over 40 hours per week. Steady work, lots of overtime, and the best climate in America. WRIGHT REFRIGERATION SERVICE, 1337 India St., San Diego, Calif.

EXCELLENT OPPORTUNITY in charge of sales department of well established and recognized wholesale parts and accessories refrigeration wholesaler. A large volume business already established covering four Eastern States. Must be thoroughly familiar with refrigeration business and must have engineering background. State qualifications in full. Box 1531, Air Conditioning & Refrigeration News.

APPLICATION ENGINEER: familiar with technical and practical applications of heat transfer equipment wanted by refrigeration and air conditioning manufacturer located in Michigan. Please advise background and qualifications. Box 1793, Air Conditioning & Refrigeration News.

COMMERCIAL application and service engineers. Large refrigeration firm with growing export business has openings in several territories for qualified refrigeration application and service engineers. Knowledge of foreign languages helpful. Write giving full details experience and references. Box 1797, Air Conditioning & Refrigeration News.

MECHANICAL REFRIGERATOR Salesman for contact work with distributors, department stores, and dealers. Must have field experience and able to handle large accounts. Excellent opportunity for good man. Well financed company with Chicago headquarters. Box 1907, Air Conditioning & Refrigeration News.

EQUIPMENT WANTED

WANTED TO BUY: 4, 6, or 8 ft. new and used single and double duty meat display cases, with or without condensing units, crated for shipment unless located in Baltimore, Philadelphia, or New York, which we can pick up uncrated. Write full particulars to GENERAL TRADING CO., Danville, Va.

SURPLUS MATERIAL wanted. We are interested in purchasing refrigeration, electrical, and hardware equipment of all descriptions. Any quantity. Send us your list. Cash transactions. Veterans. R. & R. EQUIPMENT CO., 2724 Third Ave., New York 54, N. Y.

EQUIPMENT FOR SALE

FOR SALE. Remanufactured air and water-cooled condensing units ¼ hp. up to 1½ hp. Frosted food and ice cream cabinets. EDISON COOLING CORP., 310 East 149th St., New York 51, N. Y.

NEW REFRIGERATOR. Will sell design and operating model of a home refrigerator incorporating table top working area, 4 cu. ft. of frozen food space, and 9 cu. ft. of highly accessible refrigerated area. This is a compact refrigerator developed to fit the modern kitchen. Box 1904, Air Conditioning & Refrigeration News.

Liquid Carbonic Plans National Series on Fountain, Creamer, Carbonator Servicing

CHICAGO — The Liquid Carbonic Corp. will sponsor a series of meetings for refrigeration service men to be held from the Atlantic coast to the Rockies. These meetings, scheduled from Jan. 21 to April 18, are being held in cooperation with the local chapters of the Refrigeration Service Engineers Society.

A complete program of lectures and visual demonstrations will be presented. Cut-away compressors and a condensing unit operating with a glass evaporator will reveal what happens within a refrigeration system in operation.

Liquid Carbonic refrigeration experts who will conduct the meetings are: John G. Praetz, associate member of RSES, general service manager; George Monjian, district supervisor, northwestern region, Fountain-Cabinet sales division; and Arthur H. Blanton, cabinet service supervisor, southwest region, Fountain-Cabinet sales division.

The following subjects will be covered:

1. Soda fountain refrigeration systems—their operation, adjustments, and servicing, and Liquid's latest fountain refrigeration systems.

2. Ice cream refrigeration systems—their operation, adjustments, and servicing, and Liquid's latest cabinet refrigeration system.

3. Carbonators—operation, adjustments, and servicing. An open forum period on all phases of refrigeration service concludes the sessions.

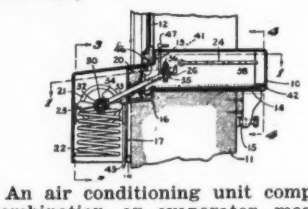
The meeting schedule is as follows (street addresses of the individual meetings can be obtained by writing the Service Department, Liquid Carbonic Corp:

Mon.	Jan. 21	Columbus, Ohio
Tue.	Jan. 22	Cincinnati
Wed.	Jan. 23	Huntington, W. Va.
Fri.	Jan. 25	Louisville, Ky.
Mon.	Jan. 28	Birmingham, Ala.
Wed.	Jan. 30	Atlanta, Ga.
Fri.	Feb. 1	Jacksonville, Fla.
Mon.	Feb. 4	Charlotte, N. C.
Wed.	Feb. 6	Richmond, Va.
Fri.	Feb. 8	Washington, D. C.
Mon.	Feb. 11	Philadelphia
Wed.	Feb. 13	Harrisburg, Pa.
Fri.	Feb. 15	New York City.
Wed.	Feb. 20	Boston
Mon.	Feb. 25	Springfield, Mass.
Wed.	Feb. 27	Schenectady, N. Y.
Fri.	Mar. 1	Buffalo
Mon.	Mar. 4	Pittsburgh
Wed.	Mar. 6	Cleveland
Thu.	Mar. 7	Toledo, Ohio
Fri.	Mar. 8	Detroit
Mon.	Mar. 11	Saginaw, Mich.
Mon.	Feb. 4	Milwaukee, Wis.
Thu.	Feb. 7	Madison, Wis.
Mon.	Feb. 11	Minneapolis, Minn.
Thu.	Feb. 14	Sioux City, Iowa
Mon.	Feb. 18	Omaha, Neb.
Thu.	Feb. 21	Des Moines, Iowa
Mon.	Feb. 25	Cedar Rapids, Iowa
Thu.	Feb. 28	Davenport, Iowa
Mon.	Mar. 4	Rockford, Ill.
Thu.	Mar. 7	South Bend, Ind.
Tue.	Mar. 12	Indianapolis, Ind.
Fri.	Mar. 15	St. Louis
Mon.	Mar. 18	Memphis, Tenn.
Thu.	Mar. 21	New Orleans, La.
Mon.	Mar. 25	Houston, Tex.
Wed.	Mar. 27	Dallas, Tex.
Fri.	Mar. 29	Fort Worth, Tex.
Mon.	Apr. 1	El Paso, Tex.
Fri.	Apr. 5	Denver, Col.
Mon.	Apr. 8	Wichita, Kan.
Thu.	Apr. 11	Oklahoma City, Okla.
Mon.	Apr. 15	Tulsa, Okla.
Thu.	Apr. 18	Kansas City, Mo.

PATENTS

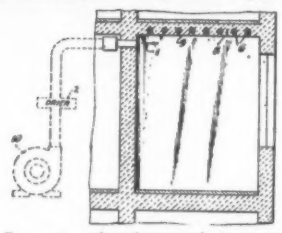
Week of Jan. 1, 1946

2,391,859. ROOM COOLING DEVICE. Earl Babcock, Duncan, Okla., assignor to The Hoover Co., North Canton, Ohio, a corporation of Ohio. Application Oct. 22, 1937, Serial No. 170,454. 38 Claims. (Cl. 62—129.)



1. An air conditioning unit comprising, in combination, an evaporator, means for circulating room air thereover, means providing an atmospheric air passageway communicating with the outside air and projecting rearwardly from said unit, a condenser disposed within said passageway, means for circulating outside air inwardly of said passageway and over the condenser therein, and means for collecting condensate from said evaporator and conducting it through said projecting means and disposing of the same into the outside air.

2,392,240. SYSTEM FOR HEATING, COOLING, AND AIR CONDITIONING OF BUILDINGS. Enrique Frankel, Santiago, Chile. Application Oct. 6, 1943, Serial No. 505,166. 3 Claims. (Cl. 257—17.)



1. In an air tempering system for dwellings and other buildings, means for cooling the atmosphere of a room or other enclosed space therein by radiation through an enclosing surface thereof, means for directing relatively dry air into said space in a direction substantially tangential to said surface and in proximity thereto, and means for flowing said relatively dry air in said direction with sufficient force to inhibit condensation of moisture from the ambient air onto said surface and promote the tempering of said ambient air.

AVAILABLE FOR LICENSING OR SALE

Pat. 2,098,753. APPARATUS FOR PRODUCING INDIVIDUAL MASSES OF ICE. Patented Nov. 9, 1937. Device may be incorporated into any type refrigerator, modification being made only in the arrangement of the freezing coils and absence of customary ice cube trays. Two endless conveyors carry a plurality of cups of resilient material in spaced-apart relation. Cups, filled with water by passing through a tank, are brought into alinement with one another to form complete spheres, sealed and held together by creation of a partial vacuum. After passing through freezing compartment, the cup carrying conveyors separate, dividing the spheres, and the enclosed balls of ice are ejected into a trough leading to a hopper. (Owner) B. H. Theodore Mulch, 369 Cedar Ave., Ridgewood, N. J. Group 35—84. Reg. No. 826.

Bryan Heads Philadelphia Electrical Association

PHILADELPHIA—Henry B. Bryans, executive vice president of the Philadelphia Electric Co., was elected president of the Electrical Association of Philadelphia at a meeting of its board of governors. He succeeds Howard L. Miller, president of Utilities Engineering Co.

SORENG

- WIRING HARNESS
- SWITCHES
- RECEPTACLES

ARE ENGINEERED TO MEET YOUR PRODUCTION REQUIREMENTS

SORENG MANUFACTURING CORPORATION

1907 Clybourn Ave.-Chicago 14, Ill.

LARGE REFRIGERATION CO.

Has openings for experienced refrigeration salesmen to work abroad. Knowledge of foreign languages helpful. Excellent money making possibilities. Write giving full details, experience, and references.

Box 1794, Air Conditioning & Refrigeration News

KRACK ENGINEERED

UNIT COOLERS
FIN COILS
AIR CONDITIONING

Refrigeration Appliances, Inc.
923 W. Lake St., Chicago 7, Ill.

Attention Manufacturers

We build freezers and boxes to your specifications on sub-contract basis, all inquiries kept confidential.

Box 1871, Air Conditioning & Refrigeration News

HEAT TRANSFER EQUIPMENT

MARLO COIL COMPANY

SAINT LOUIS, MISSOURI

In the West it's

REFRIGERATION SERVICE INC.

Pacific Coast Supply Jobber since 1928

Your letterhead will bring our latest catalog—also our House Organ,

"The Liquid Line"

3109 Beverly Blvd.

LOS ANGELES 4, CALIF.

AMANA Commercial REFRIGERATION

MODERN

- DISPLAY CASES
- COOLERS
- REFRIGERATORS
- HOME FREEZERS

AMANA SOCIETY

AMANA, IOWA

MUELLER BRASS CO.

Improved HEAT EXCHANGER

Compact and Efficient For Ice Cream Cabinet or Similar Small Installations

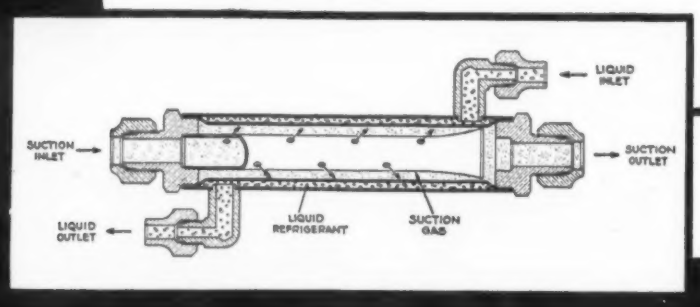
● The Heat Exchanger illustrated below is an addition to our line and intended for use in ice cream cabinet work and in similar installations where a small, compact, yet very efficient heat exchanger is required. Note that overall length is only 8¼."

It is designed to provide maximum heat exchanging capacity where available space is at a premium.

Special combinations of inlet and outlet fittings can be furnished so that this compact unit can be adapted to your particular requirements.

Catalog No.	Suction Line	Liquid Line	Overall Length	Heat Transfer Area
A-13730	½" Flare	¼" Flare	8¼"	18 Sq. In.

Flare Nuts and Seals are furnished with Exchanger, thus keeping units dry and clean.



ORDER FROM YOUR JOBBER

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Contract Service--How Can Its Problems Be Avoided?

Editor's Note: Mr. Daly, who has operated his own service shop, writes here of some of the general problems involved in "contract service" work and explains how some of the problems that come up can be avoided.

By Donald F. Daly

The start of the service season next year will see a lot of new service organizations in the field. Some will be new to the business, and some will be old timers returning to the game from war jobs and from the armed services.

Most of them will have enough mechanical ability and experience to get along all right, but there is a lot more to running a successful service business than just repairing refrigeration machines. It requires just as much business "know how" as it does mechanical "know how."

This leads up to a very important decision which must be made by almost every one of these new service organizations. That is, should they tie themselves up with contract service, or, is it better to remain free of contract obligations and be a free-lance operator? Both methods have been used successfully by many outfits, and there is a wide difference of opinion as to which is the more effective.

At first glance, contract service seems very attractive. It gives the new operator some business of which he can be sure right at the start, which is very important. On the other hand it means that he will have to take on each and every job handed to him by his contract dealers. This means a lot of tough jobs; jobs that will not only lose him money, but will take up time that could be used more advantageously.

If the new operator remains a free-lance it may take him longer to get his business rolling, but he will be in a position to turn down jobs which cannot be done at a profit, or which he is not equipped to handle. This one factor will save a lot of wear and tear on his nerves and on his pocketbook.

WHAT ARE THE ADVANTAGES?

Contract service offers many advantages to the service man as well as to the dealer, especially the smaller dealers. The larger dealers will, in most cases, have their own service organizations, but it isn't always possible for the smaller dealer to do this for several reasons. He may not have enough business to justify hiring a service man, or he may not be able to hire a competent service man for what he can afford to pay, or he just can't give it the necessary time.

Then too, it takes quite a large cash outlay to equip a service shop, and a service shop occupies space which might better be used for storage or display. A dealer is in business primarily to sell, to create good will toward his business, to build up a profitable clientele, to give satisfactory and courteous service, and to make money, not only in the present but in the future as well. This can be done by careful attention to every phase of his business relationship.

That is why an independent service organization can frequently give him better service than he could get by operating his own shop. An independent service man can give high quality service at reasonable prices, he can create good will for his contract dealers, he can frequently create sales for his dealers by giving sensible and constructive advice to the customer about the advisability of repairing or replacing obsolete or worn out equipment.

But, he can only give such service if he knows the dealer is giving him full cooperation. After all, high quality work and reasonable prices can only be had when a large volume of work is obtainable. Many dealers, and service men too, take the short sighted view in that they are too much concerned with the immediate present, and not enough concerned with the future and the overall picture.

There are many problems to be worked out in the contract service situation, but there is no reason why these problems cannot be worked out to the satisfaction of everyone concerned, if everyone concerned will take a sensible and realistic attitude.

WHAT DEALER CAN ASK OF SERVICE MAN

The dealer should insist that the independent service organization, with which he is entering into an agreement, should furnish proof of his ability to carry out his part of the contract, both from a financial and a mechanical standpoint.

The service man should be sure that the dealer with whom he is entering into an agreement is doing the type of work that he is equipped to do. He should investigate the financial standing of the dealer.

He should be sure that both he and the dealer understand the terms of the service contracts the dealer has with the manufacturer whose equipment he handles. This is very important, because it frequently happens that neither party has a very clear understanding of the terms of such contracts and their price schedules. Since a lot of the service done will stem directly from such contracts, it is essential that they be thoroughly understood.

SET UP A SCHEDULE FOR LABOR AND MATERIALS

A schedule of prices for labor and material should be drawn up and should be rigidly adhered to. In fairness to both parties it might be well to agree to open the price schedules to revision after a reasonable length of time in order to work out inequalities which might develop, and which might be against the best interests of both parties.

This covers, at least, the main points of contract service. Other problems may develop, but these too can be worked out if the original contract is carefully and intelligently drawn. Every aspect of the situation should be examined. Nothing should be assumed, and nothing should be taken for granted. If this realistic attitude is taken there is no reason why an arrangement profitable and satisfactory to both parties cannot be worked out.

To illustrate some of the troubles that develop between dealers and service men in contract service, I am going to relate some of the experiences I had with such service. These examples are fairly typical of all such problems, and may help to make it clear why nothing should be left to chance.

In 1939 I was operating a service shop in a small California city. Most of my work was obtained on a free-lance basis, but I did have verbal agreements with several dealers. The understanding was that I was to do their service on units that were still under the manufacturer's guarantee, and at the price set by the manufacturer. In exchange for this service I was to be given all of the service calls that came into their store which did not come under such contracts.

This arrangement seemed to work fairly well until I began to analyze the type of work I was getting from these dealers. One dealer had given me several jobs, but here is what they were: four Grunows; three majestics; two Hotpoint semi-sealed units; one Coldspot; and one Kelvinator water cooler which was wet and had stuck up.

GETS THE 'TOUGH ONES'

I had expected to get jobs like these. Every service shop does get them, although they are tough jobs and frequently impossible to handle in a small shop. But I didn't expect to get that many.

When I asked this dealer how come I was getting so many tough jobs and no good jobs, he said that, "he hadn't understood that he was to give me all of his jobs, but just the ones his own man couldn't handle."

I expressed suprise that he had his own man. He said, "Oh, yes. Bill has been with me for years. He isn't exactly a refrigeration mechanic, but he has learned to do minor repairs on radios, washing machines, stoves, and refrigerators. He can change belts, motors, thermostats, put on door gaskets, hardware, clean condensers, oil motors, and all sorts of jobs like that."

What it amounted to was that he was going to keep all the quick money jobs, the small jobs that meant anywhere from $3 to $15 to the service man, and which he must have, along with the tough jobs, to round out his business. Without them he cannot operate. It didn't take me long to discover that most of my contract dealers had their "own man." And, that they were keeping the good jobs for him and giving me the "dogs."

I didn't blame these dealers too much. After all, I didn't have written contracts with them, and I had taken a lot for granted. This is why I strongly urge that, before entering into a service contract, both parties should be sure that they understand the terms of such contracts.

Another problem which occurred with exasperating regularity, and which I never could get around, would go something like this—I would get a call from a dealer saying that he had a job for me, but he wanted to talk to me before I made the call. I would go to his store and he would greet me something like this:

"Don, Mrs. J. who lives out of town a few miles has an old Kelvinator which has gone bad on her. It's a pretty old box—in fact they are going to buy a new one. Mr. J. was in last week and signed up for a new deluxe model, but he doesn't want to take delivery until their wedding anniversary which won't be for a couple of months. I know they won't want to spend much on the old box under the circumstances. So, see what you can do for them. But, for heavens sake, don't do anything that will queer my deal for the new box."

When I got out to Mrs. J's I found that some one had stuck an icepick into the evaporator. Since it was a sulphur job and operated under a vacuum, it had taken in moisture and the compressor had frozen up. The belt had broken, fortunately, so the motor was O.K. I explained to Mrs. J. that the unit was in bad shape and would have to be completely dismantled and overhauled, and that the job would cost about $65. She said that she just couldn't spend that much money on the old box since she knew her husband was surprising her with a new one on their wedding anniversary. Wasn't there some way I could patch it up so it would run for awhile? After all, it was only two months.

So I pulled the compressor off, heated it up with a blow torch and got it so it would turn fairly free, put a pint of xylene in the crankcase and ran it for 30 minutes. Then I dumped the xylene, flushed it with carbon-tet, filled the crankcase with half oil and half xylene, put the compressor back on, pumped down to zero pounds, stuck a small brass screw into the icepick hole, ran some solder around the screw head, started the unit up, collected $9, and took off for town mumbling to myself and wondering how I got into such things. I didn't know if the unit would run for 15 minutes or a year, and I didn't care very much.

I could understand the dealer's viewpoint on this deal. He wanted to make his sale and earn the goodwill of his customer. But he didn't have any right to expect me to pay for this goodwill. I was put on the spot, and took a chance on losing my reputation for doing good work.

Here, again, it is evident that there should be a clear understanding of the relationship between the dealer and his contract service man. It is the duty of the contract service man to promote goodwill for his dealers. But he should not be put on the spot, and he should not be forced to take a financial loss on such transactions.

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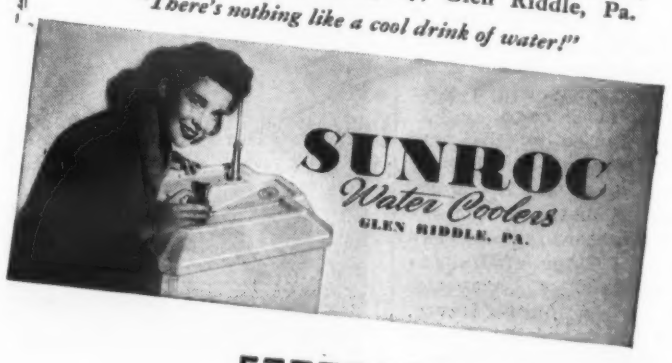

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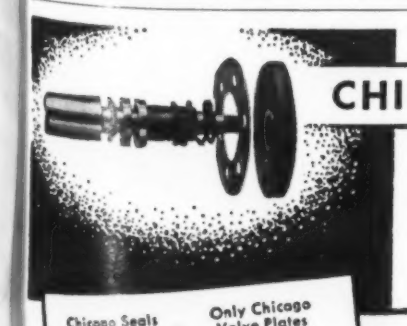

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Detroit Contractors To Join 'National'; Plan School Aid

DETROIT — Decision to join the National Association of Refrigeration Contractors now being formed, was made at the January meeting of the Refrigeration Contractors Association of Detroit, along with selection of a committee to consult with public school officials on development of a sound curriculum for refrigeration courses.

Members also talked over the veterans' training-on-the-job plan in which most of them are now participating. The Association is cooperating with the Detroit Board of Education and the Veterans' Administration in this plan.

William G. Euth, president of the Association; Benjamin G. Hyatt, vice president; and Raymond M. Shock, executive secretary, were chosen to represent the organization at the meeting of the national group in Cleveland Jan. 21-22.

The Association selected James E. Perry, a member of the board of directors, as chairman of the committee for consultation with school officials. James Terry and Hall Mabley were named as the other committee members.

Specifically, this committee will look into the refrigeration course inaugurated last Fall at Cass Technical High School here, with the view of offering the Association's cooperation for development of the best possible curriculum. It was suggested that veterans would be aided in their apprenticeship training by enrolling in a trade school course, such as that at Cass Tech., and that the contractors could make recommendations to these schools which would prove mutually beneficial.

Some members felt that more emphasis was needed on the practical phases of refrigeration. Consensus was that lectures by experts on their specialties would contribute considerably to turning out students well-versed in fundamentals.

(Started last September after discussions with an advisory committee made up of ASRE and ASHVE members, the Cass Tech course has created a demand that far exceeds the school's capacity, according to the principal, W. E. Stirton. He said that in addition to the regular students, the course is attracting night school students who want to be upgraded in the refrigeration field and veterans attending under the GI Bill of Rights.)

Members of the Association have been asked to submit a list of requirements they feel refrigeration service men must possess to be considered properly trained. This was requested so the group can get a blanket approval for its training-on-the-job program and have a standard plan.

Contractors In Indiana Organize State Group

INDIANAPOLIS—William L. Drake, owner of Drake's Refrigerator Service Co., of this city, was elected president of the Indiana Chapter of the National Association of Refrigeration Contractors at its organizational meeting here Jan. 10 at the Hotel Lincoln.

Mr. Drake, who has had 13 years' experience in the refrigeration business, also is membership chairman of the national association which was organized Dec. 20 in Chicago.

Other officers named by the new Indiana chapter were C. E. Crosby, vice president, and G. A. Post, secretary-treasurer, both of Indianapolis. Named directors for one-year terms were E. R. Claus of Indianapolis, Dan Hoagland of Lafayette, Charles Crane, Jr., of Terre Haute, G. L. Titus of Crawfordville, Virgil W. Turner of Columbus, and Herbert Hale of Kokomo.

The state chapter's charter membership is comprised of approximately 25 refrigeration sales and service men from 15 Indiana cities. The organization's purpose is to improve standards of the industry and promote the welfare of its members.

Plans were discussed for a membership drive and attendance at the organization's first national convention, Jan. 21 and 22, in Cleveland.

Condensing Unit Price Committee To Meet--

(Concluded from Page 1, Column 2)

for the formation of a new Industry Advisory Committee last fall.

Where individual price increases have been granted, the reseller of the condensing unit, if he is a dealer and sells the condensing unit as such, has been permitted to pass along the price increase to the buyer. However, if the condensing unit is purchased by a fixture manufacturer who employs it as a part of the self-contained product, then that manufacturer must apply to OPA for permission to put the added cost on his price.

Represented on the committee are manufacturers of refrigeration compressors and condensing units up to 5 hp. Sterling Smith of Baker Ice Machine Corp. is chairman of the committee. Other members include: B. J. Scholl, Brunner Mfg. Co.; Frank Gleason, Copeland Refrigeration Corp.; Frank Smith, Tecumseh Products Co.; Harry Pendergast, Lunch Mfg. Co.; George S. Jones, Servel, Inc.; W. F. R. Karsten, General Electric Co.; H. F. Hildreth, Westinghouse Electric Corp.; Harry Hedrick, Mills Industries, Inc.

E.E.I. Conference April 2-4

CHICAGO — Edison Electric Institute's twelfth annual sales conference, discontinued during last year's travel restrictions, will be held at Chicago's Edgewater Beach hotel on April 2-4.

RFC Transfers All Surplus Property Activities to the War Assets Corp.

WASHINGTON, D. C.—The Reconstruction Finance Corp. has announced the transfer of all its surplus property activities to the War Assets Corp. effective as of the close of business Jan. 15, 1946.

The War Assets Corp., a subsidiary of the Reconstruction Finance Corp., has been designated by the Surplus Property Administrator as the disposal Agency for all government-owned surplus consumer goods as well as producers and capital goods.

Lt. Gen. E. B. Gregory, Army Quartermaster General, at the request of President Truman, has taken office as chairman of the Board of Directors of the new corporation, which will be responsible for the sale of all such property declared surplus by the Army, Navy, in addition to other government agencies.

It is estimated that property, the original cost of which was $23,000,000,000 will be declared surplus during the fiscal year, July, 1945, through June, 1946.

The War Assets Corp. will sell surplus property through regional offices whose territories correspond to those of the RFC Loan Agencies which will furnish necessary facilities and personnel to aid the newly formed agency.

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